Structural changes in Vietnamese industry and trade during 1989-2005: An Input – Output analysis

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ABSTRACT

This study uses four Vietnamese Input-Output Tables of 1989, 1996, 2000, 2005 (at constant 2000 price) to analyse the structural changes in industries and trade of Vietnam. The method of factor decomposition and the analysis of industrial linkage effects are employed. Furthermore, with the view of having a more vivid picture, skyline charts are also utilized. The results point out that there was a remarkable switch from agriculture to industry and service during 1989-2005. Time witnessed growth by leaps of such sectors as post and telecomunication, finance, insurance, real estate and business services. Mining and quarrying remained the highest export sector in terms of its export percentage to its total demand. Industrial materials and capital goods constitute the highest import sectors in terms of their imports share to total supply of these sectors. Besides, industrial materials, capital goods and other consumer goods had strong forward and backward linkages. Surprisingly, import substitution and technical change did not play a consistently positive role in sector growth, even considerably held back the growth. Therefore, we suggest that domestic supply boost and technical betterment will play a decisive role in trade structure modernization and inter-industrial linkage strengthening as well as sector expansion.

Key words: Structural change, Vietnam, Input-Output table analysis, Industry, Trade
JEL Classification Codes: C67, F14, L16

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CHAPTER I: INTRODUCTION

I.	Scope and Objectives
II.	Methodology
III	Research questions
IV	Data sources
V	Structure of the paper

I. Scope and objectives

This research aggregates all sectors in the Vietnamese economy as a whole into 16 sectors in order to facilitate studying changes in sectoral share and trade. Industry and trade performance during1986-2005 is viewed to create a general picture that how Vietnamese sectors and trade are developing. If one sector grows, it will bring about the growth of not only this sector alone but also others, but by what means and to what extent? The thesis will help answer such kinds of questions. In addition, there are many factors affecting the expansion of one sector. Factors which serve as bottle-necks must be identified for improvement efforts. Then a number of implications will be drawn out.

II. Methodology

The study is primarily based on the input-output analysis applied for all the economy. This analysis tells a virtual information world hidden beyond the national input-output tables (Leontief 1986, p. vii), tracing sources of growth, the direct and indirect intersectoral relationships among sectors of the complex economy. Within the scope of this research, growth factor decomposition analysis and industrial linkage analysis are used. Besides, skyline chart analysis is viewed to further clarify matters.

Furthermore, descriptive analysis is also used through looking at Vietnamese economic history. By listing some striking progressive economic policies applied in Vietnam, describing the changes in the economic thinking of the Vietnamese leaders and reviewing some remarkable economic successes over 1986-2005, the shift in production and trade structure is closely connected with the economically historical context. And obviously, the review of the theoretical framework and literature relevant to the research is an integral part of the thesis, which helps the author inherit the achievements of previous studies and avoid repeating what have been done so far.

III. Research questions

● *Central research question:*

What is the change in the industrial and trade structure during the period studied?

● *Sub-research questions:*

+Among all the sectors studied, which increase their share and which decrease their share in their total output? And what are the changes in share of sectors‘ imports and exports in GDP?

+Which sectors have strong forward or backward linkages?

+What are sources of output growth? What factors explain the sources of change in the output of a sector?

+Implication: What should be done to encourage positive factors to accelerate economic growth in Vietnam?

IV. Data Sources

Essentially the present study employs data of four Vietnamese input-output tables derived from the General Statistics Office of Vietnam, and the Ministry of Finance:

- The Input-Output table, 1989 (Vietnam, General Statistics Office 1992)
- The Input-Output table, 1996 (Vietnam, General Statistics Office 1998)
- The Input-Output table, 2000 (Vietnam, General Statistics Office 2002)
- The Input-Output table, 2005 (updated from Policy Advisory Group, the Ministry of Finance).

To show the real changes in the variables and compare all input-output tables, all the nominal 2005, 2000, 1996 and 1989 prices have been converted into the 2000 constant prices. Also 112 sectors in the 2005, 2000 tables, 97 sectors in the 1996 table and 54 sectors in the 1989 table will be aggregated into 16 sectors for the convenience and consistence of analysis.

Besides, such data as GDP growth rates, consumer price index, foreign direct investment, GDP structure, GDP shares of state and non-state economic sectors from the General Statistics Office of Vietnam and the International Monetary Fund are used to further clarify the analysis. Additionally, the Vietnamese key economic indicators updated from the World Bank are also employed.

V. Structure of the Paper

The thesis consists of five chapters. After the introduction chapter, the rest is divided into four chapters. Chapter II covers Vietnamese economic history from 1986 to 2005. The theoretical framework and literature review are presented in chapter III. The main part of the

research belongs to the following chapter, which provide input-output analysis of structural changes in Vietnamese industry and trade during 1986-2005. Then is the final chapter giving some brief conclusions and policy recommendations and suggesting some areas for further study.

CHAPTER II: VIETNAMESE ECONOMIC HISTORY

I.	An overview
II.	From 1986-1989
III	From 1989-1996
IV	From 1996-2000
V	From 2000-2005

I. An overview

After the reunification of Vietnam in 1975, the government started implementing centrally-planned tasks similar to Soviet-style one, which focused on agricultural collectivization and heavy industry (Ninh 2003). Keeping a leading role in allocating resources and distributing products to units of production was the state. As Ninh (2003) mentioned, this model became stretch tight in the late 1970s when no longer could the state be capable of supplying inputs to the whole economy as well as supplying food to all people. The remarkable gap between free-market prices versus official prices revealed the authorities' failure to control the system of economic centralization. Then with its attempt to be out of the great tension, Vietnam carried out the economic management recentralization. However, this negatively contributed to the 1986 hyperinflation. As a consequence, in the Sixth Congress of the Communist Party of Vietnam organized in December 1986, it was decided to wipe out the central planning mechanism, directing toward a market economy.

To modernize economic thinking when feeling her way was a turning point, making a great contribution to the economic renovation of Vietnam (Luoc 2004). A wide variety of such measures as anti-inflation, market mechanism exercise, trade liberalization application, multi-sectoral economy implementation, financial-banking system innovation, agricultural policy

improvement, regional and global integration, legal system preparation consistent with a market mechanism, human resource training were taken. Extending outward orientation of Vietnam was not seen only in economics but also in politics. That Vietnam-US relationship was fully normalized, Vietnam became a full member of ASEAN in 1995, of APEC in 1998 and joined WTO in 2007 was a first spring-board on the path to economic development and improvement of international relations in the new context of international integration. As a result, the economy achieved a high growth rate. Social as well as political stability was established.

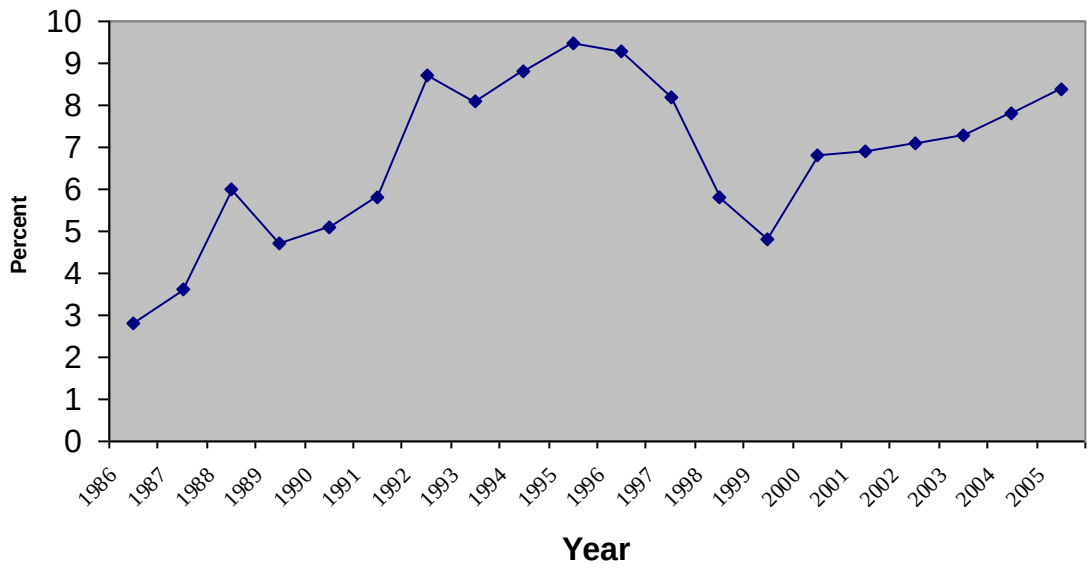


Figure 2.1: Economic growth rate of Vietnam, 1986-2005

Sources: Tho *et al* (2000) and GSO (2008a) (Also see Annex 1)

The all-sided reform program completely opened a new period for Vietnam (Kokko 1998, Xuan 2000, Ngoc *et al* 2007). Together with macro-economic improvements, as well as social and political stability, people‘s living conditions were also improved. The poverty reduction of an estimated 35 percent over the first decade of renovation, an outstanding attempt to train

doctors and nurses for better health care services, a rising provision of electricity, safe water and sanitation, an increasing rate of primary education (UNDP 1996) were desirable. However, South Vietnam grew faster than the North (Dapice 2004).

Besides these above remarkable changes, the economic structure was also modified: Sectoral share of agro-forestry-fishery reduced from 38.7% in 1990 to less than 22% in 2003 , while that of services increased from 35.7% to 40.5%, and industry and construction from 22.6% to 40.5% (Luoc 2004, p. 17). Cultivation shifted in the direction of increasing the quantity of such highly competitive products for exports as coffee, tea, rubber, cashew nuts. There appeared series of export-processing zones as well as high-tech zones. Services were developed as well. Luoc (2004) insisted that exports and imports also registered striking growth rates.

From 1986 till now, though the Vietnamese economy spectacularly changed its look, it experienced various ups and downs. The following sections will present in more detail each period of the Vietnamese economy. As the above figure 1 showed, the 1986-1989 period was the one of the economic renovation. Being a more open economy was the 1989-1996 period. Over 1996-1999, there were economic slowdown. Then was the period of recovery signs.

II. From 1986 to 1989

The year 1986 was marked by the implementation of the Doi Moi process. It was the first attempt of the government to make a transition to a socialist orientated market economy. Though the state still kept its decisive role, a multi-sector economy was first time allowed to advance (Luoc 2004, p. 24). Following this, in 1987, such various measures as dismantling the inter-provincial barriers of trade, passing the Law on Foreign Investment, promulgating the Land Law which accepted the rights to agricultural land use, providing a more market-based

exchange rate, accelerating the open-door policy, were taken. In 1988, Resolution 10 on the right to farm land use to peasant households was passed. Ninh (2003) affirmed that abolishing the cooperatives of agriculture and giving land back to peasant households was striking points. This helped peasants have more incentives to work harder to heighten their productivity. Besides, the two-tier banking system was established. Over 1987-1988 the strain of the state control over state-owned as well as private enterprises, agricultural sector activities, foreign trade, banking and FDI as well became slackened. Never did Vietnamese exports reach US$ 1 billion as in 1988 (Luoc 2004, p.24).

However, there still existed the dual pricing system. Then in 1989, the problems of economic structure were put under consideration in order to take a further step of comprehensive reforms. To remove the state prices for nearly all consumer goods made a big contribution to liberalize prices of goods. No longer did the dual pricing system exist. Except for export of ten commodities and import of fourteen ones, quotas for nearly all commodities were abrogated. The year 1989 was the first time Vietnam became the thirst biggest rice exporters from net rice importers in the previous years, marking a sky-rocketed increase in Vietnamese rice export.

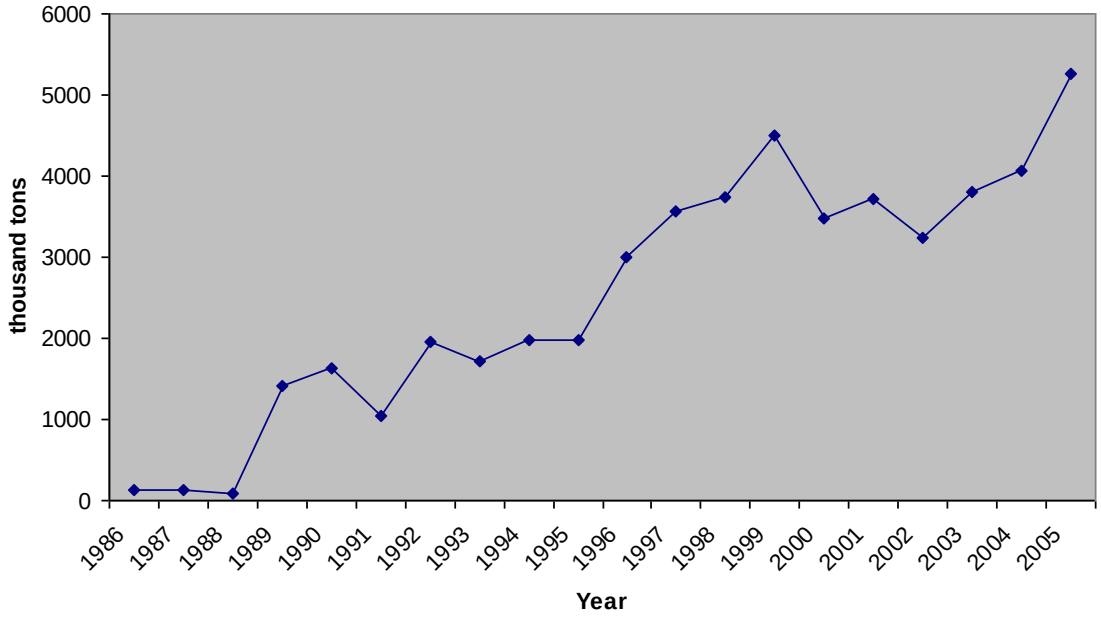


Figure 2.2: Rice export of Vietnam, 1986-2005

Sources: Tho *et al* (2000) and GSO (2008c) (Also see Annex 2)

Rice exports were encouraged, partially thanks to the liberalization of the trade regime and investment. Besides, private enterprises had more room to raise their initiatives (Ninh 2003). In addition, in line with the dong devaluation, there existed the system of multiple exchange rate unified. According to Dinh (1998), a wide variety of policies and measures were taken in the middle 1980s with the aim of reducing the inflation rate, which were:

i. Hard controls over the state budget, including revenue increasing and expenditure decreasing. Thus budget deficit was lessened.

ii. Heightening the state bank ‘s capability in an effort to keep money circulation under control, putting the commercial banks under business mechanism, making use of more payments of non-cash, enhancing foreign exchange control, initiating in the interest rate aspects and savings attraction. Real interest rates were taken to positive levels.

iii. Balancing the supply and demand of commodities, which affects much the CPI.

All in all, the economy restored, the consumer price index felt from 874.7% in 1986 down to 136% in 1989 and continuously down to stable rates in subsequent years as can be seen from figure 2.3 below (also see Table A5).

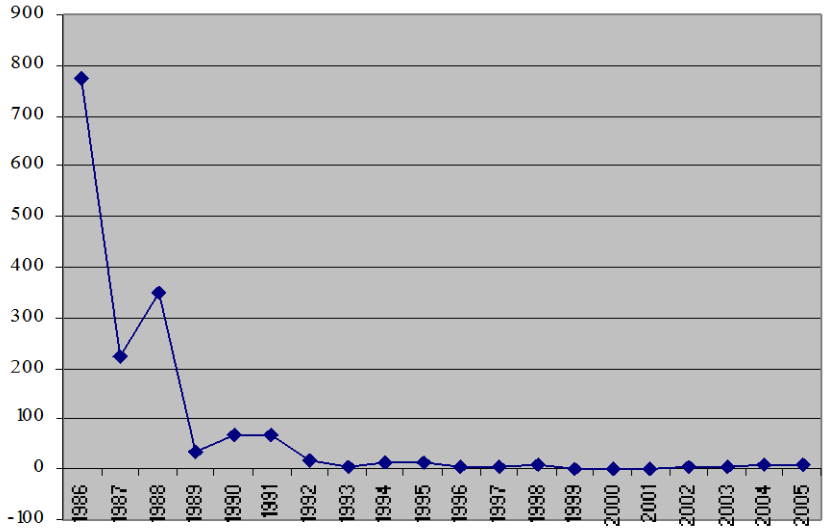


Figure 2.3: Consumer price index in Vietnam: 1986-2005 (%)

Source: Tho *et al* (2000) and GSO (2008b) (also see Table A5).

III. From 1989 to 1996

Over 1992-1996 the economic growth rates were all above 8 percent except for the years 1989, 1990, 1991 with those of 4.7%, 5.1%, 5.8% per year (see Table A1), . From different points of view, economic researchers have different ways in dividing Vietnamese economy into different periods. According to Dinh (1998), it could be considered the 1991-1995 as a new growing economic one. The GDP increase in this period surpassed "all targets of outstanding results" (Dinh 1998, p.2). Yet, Ninh (2003) insisted that the reform taken in 1986-1989 in combination with the fact that Vietnam situated strategically in the middle of the most rapidly growing region brought the country to fast economic growth, particularly in the 1992-1997. However, export grew even further (Kokko 1998), reaching US$ 5 billion in value in 1995 (Luoc 2004). Over the 1990-1995 period,

exports and imports increased 2.16 and 2.72 times, respectively (Dinh 1998). The influx of capital and technology contributed to modernize the economy. Ngoc *et al* (2007) regarded the 1990-1996 period as a new phase of internationally relational development. The year 1990 was marked by the amendment of law on foreign investment as well as the establishment of corporate law acceptable for limited liability companies and joint-venture ones to operate. The sharp increase in FDI shown below was a striking demonstration of a more opened-door phase.

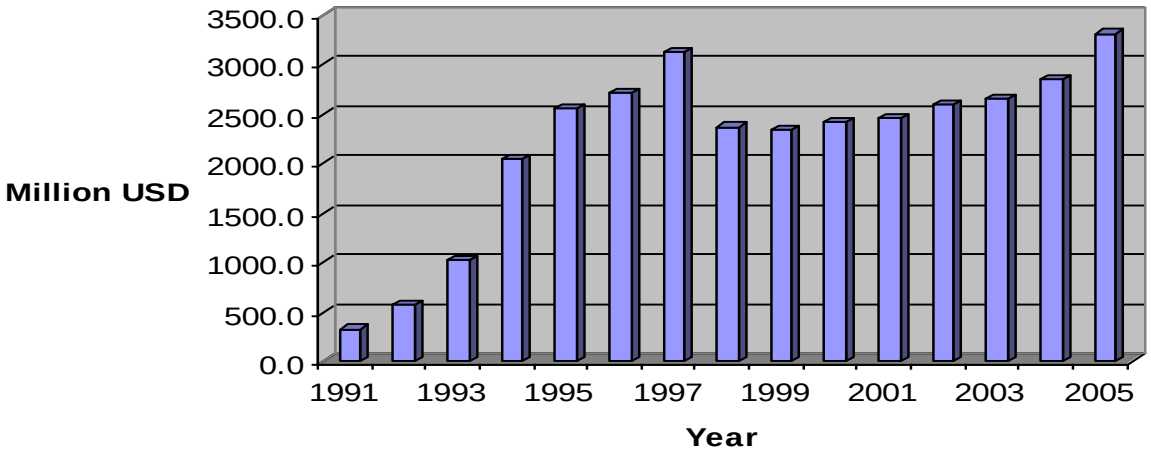


Figure 2.4: Foreign direct investment licensed in period 1991-2005

Source: GSO (2008d) (See also Table A3)

As Dinh (1998) indicated, there appeared a trend to direct the economy to industrialization during 1990-1996 as a result of the comprehensive reform beginning in the middle of the 1980s.

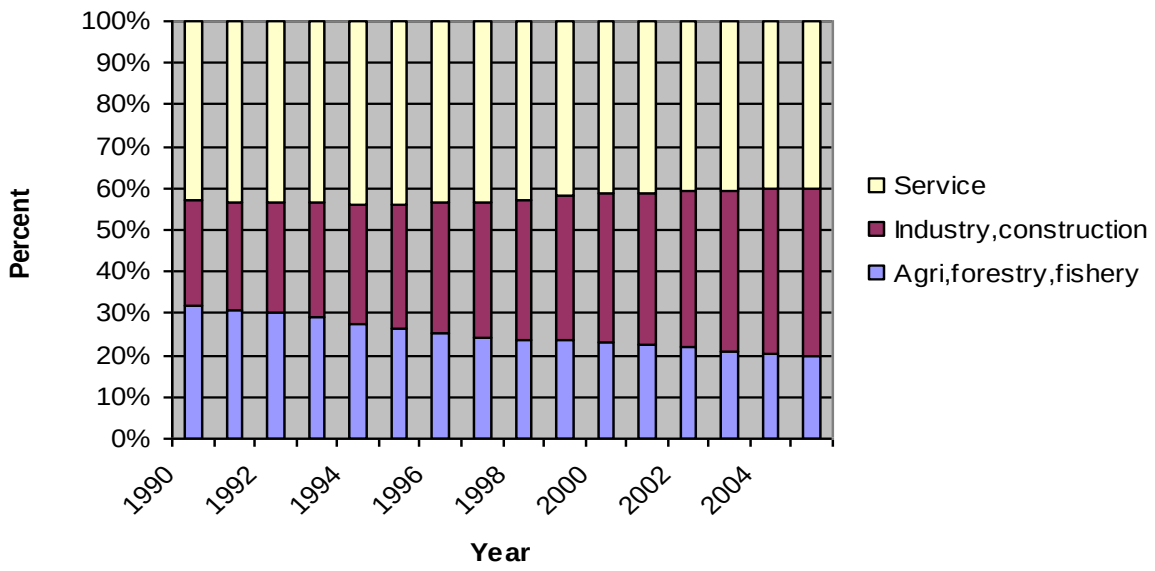


Figure 2.5: GDP structure, 1990-2005

Source: GSO (2008e) (See also Table A4)

Noticeably, in company with rapid economic growth, the National Hunger Eradication-Poverty Reduction Program was started in 1992. In accordance with Fritzen (2002), it was very likely that the Vietnamese residents stood to benefit from Vietnam‘s experience that it gained one of the fastest poverty reduction rates over the world through the 1990s.

IV. From 1996 to 2000

This period was recognized as a slowdown economic stage. At first, it could be assigned this reduction in economic activities to the 1997 Asian crisis. On the other hand, some researchers thought that the slowing down of the Vietnamese economic growth since 1998 was the result of both the 1997-1998 Asian crisis, which led to the fall in FDI and exports, and the weaknesses in the internal economic structure as well (For example, Ninh 2003). However, as Kokko (1998) pointed out, Vietnam came through the Asian crisis safely although most of its ASEAN neighbors suffered

severely. According to Xuan (2000), the 1997 Asian crisis did not make Vietnamese trouble but revealed it. He stressed that the 1997 Asian crisis was not a profound reason of Vietnam's economic slowdown. In addition, Dat (2004) affirmed that although realized as an economy growing rapidly, Vietnam almost exhausted well before the 1997 Asian economic crisis. It was seen clearly from remarkable drops in indicators of economic growth since 1996 (Dat 2004, p. 322).

As Kokko (1998) indicated, despite of some slackening in rapid growth, there was a total growth rate of an estimated 6.6 percent for the two quarters of 1998. Export growth was from 5 to 10 percent, serving as a positive factor. In spite of its increasing, the inflation rate was still lower than 10 percent. Additionally, the reduction in the purchasing power of VND with regard to the US dollar was only about 20 percent. But that FDI decreased and unemployment rate became mildly larger made an adverse effect. Nevertheless, Vietnam's general picture at that time was not gloomy like its neighbors such as Thailand, Indonesia, South Korea and Malaysia (Kokko 1998, p.1).

If Vietnam was not affected by Asian crisis, it was because its financial market developed with little strength, attracting trivial foreign capital. Looking at Vietnamese economy through 1997-2001, Fforde (2001, p.18) came to a conclusion that it was very likely to be good, achieving much better result than other ASEAN members because Vietnam was a "late comer" with her financial market relatively closing. Thus foreign investors' withdrawal from emerging markets of Asian did not disturb Vietnam. There did not appear a collapse of stock market because there was not any stock market (Kokko 1998). The VND was not floating. Trade and foreign exchange transactions were absolutely controlled, keeping the foreign exchange rate remain.

Although the slowdown in economic growth was not influenced much by the 1997 Asian economic crisis, it was likely to be affected by other factors such as the Asian flu bird, especially the inherent weaknesses and shortcomings deep inside the economy. Kokko (1998) mentioned that

most state-owned enterprises (SOEs) that had dominance in the manufacturing sector were not efficient and severely in debt. Furthermore, the poor financial system and the transparent absence of the market exposed Vietnam's feeble economic foundation. Still more, most of the SOEs performing in the industries of import substitute revealing worldwide uncompetitive. The remarkable foreign debt, a big current account deficit and the overvalued VND constituted negative impacts on Vietnam.

Table 2.1: The GDP shares of state-owned and non-state economic sectors, 1989-2000

Year	State-owned sector (percent)	Non-state sector (percent)
1989	33.2	66.8
1990	32.3	67.7
1991	33.2	66.8
1992	34.3	65.7
1993	35.4	64.6
1994	36.7	63.3
1995	40.2	59.8
1996	39.9	60.1
1997	40.5	59.5
1998	40.0	60.0
1999	38.7	63.1
2000	39.0	61.0

Source: Dodsworth *et al* (1996) for data to 1994, post 1994 data from IMF (2002)

From the table 2.1, it seems that the non-state sector made up a pretty great share in GDP. Yet, as pointed out by Ninh (2003), if peasant households and foreign enterprises were not taken into account, that share would be much lower. This indicated domestic private enterprises did not play an important role in the economy of Vietnam.

Taking a look at export structure during 1996-2000, Fforde (2001, p.9) realized that first was oil doubling its amount, primarily benefited from actions taken by OPEC in order to push oil prices up. Crude oil exports alone made up 24% of gross exports. Second were such other primary products as rice and coffee as well as sea food. Third were exports of light industries. Then he concluded that

the picture of export diversities was of great value. In addition, in spite of market losses in such countries as Taiwan and Singapore, the country rapidly reoriented her exports to other markets, especially China, the EU and ASEAN countries.

V. From 2000 to 2005

The year 2000 was marked by the spring of the economy. Together with robust output increase, the unemployment rate decreased accordingly. In terms of foreign trade, imports grew generally faster than exports. That the external debt made up a great share c GDP shown the economy depended heavily on outside force.

The general picture of the Vietnamese economy is shown by table 2.2 below:

Table 2.2: Vietnamese key economic indicators, 2000-2005

	2000	2001	2002	2003	2004 e/	2005 p/
	Year	Year	Year	Year	Year	Year
Output, Employment and Prices						
GDP (% change previous year)	6.8	6.9	7.1	7.3	7.7	7.5
Industrial production index (%change,previous year)	15.7	14.6	14.5	15.5	16.0	16.0
Unemployment rate (%, urban areas)	6.4	6.3	6.0	5.8	5.6	5.5
Consumer price index (% change, period-end)	-0.6	0.8	4	3	9.5	8.5
Pulic Sector						
Government balance (% GDP)	-2.8	-2.9	-1.9	-2	-1.4	-1.4
Domestic public sector debt (accumulated, % GDP)	4.5	5.5	6.3	6.8	7.5	8.3
Foreign Trade, BOP and External Debt						
Trade balance ($US million)	-1,187	-1,135	-3,027	-5,107	-5,451	-7,340
Exports of goods ($US million)	14,448	15,027	16,706	20,149	26,503	31,804
Exports of goods (% change, previous year)	25.2	4	11.2	20.6	31.5	20
Key exports (value, % change) - crude oil	67.5	-10.8	4.6	16.8	48.3	35.0
Imports of goods ($US million, cif)	15,655	16,162	19,733	25,256	31,954	39,144
Imports of goods (% change, previous year)	34.7	3.2	22.1	28.3	26.5	22.5
Current account balance ($US million)	641	672	-418	-1,946	-1,702	-2,325
Current account balance (percent GDP)	2.1	2.1	-1.2	-4.9	-3.8	-4.6
Total external debt (%GDP)	37.2	35.1	34.8	36.4	35	35.5

Source: World Bank (2005)

However high, the economic growth rate seemed unsustainable in the long term. Really so, it can be seen that the consumer price index experienced a drastic and unforeseeable fluctuation. The

inflation rate ran at 3% in 2000, but unexpectedly came at up to 9.5% in 2004, then down to 8.5% in the following year. Partially, the reasons were the increase in world oil price and the spread of bird flu disease. Yet, it was arguable that the underground cause was the credit of the state to SOEs (Ngoc *et al* 2004, p. 13). Because of the inefficiency of the state-owned sector, how long the Vietnamese economy can keep on growing fast is still questionable.

CHAPTER III: THEORETICAL FRAMEWORK AND LITERATURE REVIEW

I. Theoretical Framework
II. Literature Review

I. Theoretical Framework

Nobel Laureate-Wassily Leontief is the founding father of input-output economics, which is also known as interindustry economics. He was interested in transactions among such industries as agriculture, industry and service to much more detailed degree to discover their relationships (Leontief, 1986). Then the further development of this economics field has been facilitated by many economic scientists. This paper uses Akita's (1991) approach, that was the factor decomposition method introduced first by Chenery (1960), to explain the change in the gross output. The differential change is decomposed into the following four causal factors:

1. IS: Import substitution, or the total effect on the output in which the proportional increase in each sector 's domestic demand is supplied by domestic production.
2. TC: Technological changes, or the total effect on the output made from the change in input-output coefficients in the economy. In other words, it is intermediate-demand expansion.
3. DD: Domestic-demand expansion, or the total effect on the output derived from expansion of final consumption (FC) (including private consumption and government consumption) and gross domestic capital formation (FI).
4. EE: Export expansion, or the total effect on the output stem from export increase in the whole economy.

In an open Leontief system, from the fundamental balanced equation between supply and demand sides we have:

$$X = W + D + E - M \quad (1)$$

In which:

X: Vectors of gross output

W: Intermediate demand

D: Domestic final demand

E: Export demand

M: Import demand

It is noted that intermediate demand of the i^{th} - sector could be obtained by multiplying the i^{th} - row of the input-output coefficients by gross output vector as follows:

$$W = AX \quad (2)$$

In which A is an input-output coefficients matrix

On the other hand, import ratio equals import demand to domestic demand:

$$m = M / (D+W) \quad (3)$$

In which:

m: diagonal matrix of import coefficients

Combining (1), (2) and (3) we have:

$$X = AX + D + E - m(D+W)$$

Or

$X = AX + D + E – m(D+AX)$

Or

$X = (I-m)(AX + D) + E$

By putting $p = I-m$, where p stands for a diagonal matrix of domestic supply,

$X = p (AX + D) + E$

Then,

$X = (I-pA)^{-1} (pD+E)$

By denoting $B = (I-pA)^{-1}$ (B is the domestic Leontief inverse),

$X = B (pD + E)$ (4)

By subtracting X_0 from X_t:

$$\Delta X = X_t - X_o$$

$$= B_t(p_t D_t + E_t) - X_o$$

$$= B_t p_t (D_t - D_0) + B_t p_t D_0 + B_t (E_t - E_o) + B_t E_o - X_0$$

$$= B_t p_t \Delta D + B_t \Delta E + B_t p_t D_0 + B_t E_0 - X_0 \quad (5)$$

The last three terms of the above equation can be written as:

$$B_t p_t D_0 + B_t E_0 - X_0$$

$$= B_t p_t D_0 + B_t E_0 - B_t B_t^{-1} X_0$$

$$= B_t p_t D_0 + B_t E_0 - B_t (I - p_t A_t) X_0$$

$$= B_t p_t D_0 + B_t E_0 - B_t X_0 + B_t p_t A_t X_0$$

$$= B_t p_t (A_t - A_0) X_0 + B_t p_t A_0 X_0 + B_t p_t D_0 + B_t (E_0 - X_0)$$

$$= B_t p_t \Delta A X_0 + B_t p_t (A_0 X_0 + D_0) + B_t (E_0 - X_0)$$

$$= B_t p_t \Delta A X_0 + B_t p_t (A_0 X_0 + D_0) - B_t p_0 (A_0 X_0 + D_0) \quad (6)$$

(Because $X_0 - E_0 = p_0 Y_0$; $Y_0 = A_0 X_0 + D_0$)

By substituting (6) into (5),

$$\Delta X = B_t p_t \Delta D + B_t \Delta E + B_t p_t \Delta A X_0 + B_t p_t (A_0 X_0 + D_0) - B_t p_0 (A_0 X_0 + D_0) \quad (7)$$

$$= B_t [\Delta p (A_0 X_0 + D_0) + p_t \Delta A X_0 + p_t \Delta D + \Delta E] \quad (8)$$

Where subscripts 0 and t represent the initial year and the terminal one, respectively.

By denoting IS = $B_t \Delta p (A_0 X_0 + D_0)$

TC = $B_t p_t \Delta A X_0$

DD = $B_t p_t \Delta D$

EE = $B_t \Delta E$

where IS, TC, DD, EE are mentioned-above

we have:

$$\Delta X = IS + TC + DD + EE$$

The equation of factor decomposition (8) utilizes the terminal year structural parameters, p_t and B_t, and the initial year volume weights, X_0 and D_0. But if we use the base year structural parameters, p_0

and B_0, and the terminal year volume weights, X_t and D_t, also a factor decomposition equation can be created as:

$$\Delta X = B_0[\Delta p(A_t X_t + D_t) + p_0 \Delta A X_t + p_0 \Delta D + \Delta E] \quad (9)$$

Like Akita (1991), in this paper each components is a simple average of alternative components derived from the two factor decomposition equations (8) and (9). And domestic final demand expansion is further separated into final consumption (FC) and gross domestic capital formation (FI):

$$\Delta X = IS + TC + (FC + FI) + EE \quad (10)$$

- Besides the factor decomposition method, this paper also uses the degree of sensitivity index and the index of dispersion power for analyses. The former serves as forward linkage effects, attaining by taking the quotient of the sum of the ith row of the inverse matrix to the industry average. The later stands for backward linkage effects, which is obtained by taking the quotient of the sum of the jth column of the inverse matrix to the industry average. The degree that is greater than 1 shows a sector of high forward or backward linkages.

II. Literature Review

1. In the world

Input-output economics was firstly developed by Wassily Leontief (1905-1999), who won the Nobel Prize for his foundation contribution of this field. Since then it has been further developed by increasing numbers of researchers in a variety of academic fields. There are also numerous books involved in this subject. For example, Raa (2005) presented the economics of input-output from a mainstream view. Besides, the analysis has been employed to resolve most pressing

problems with regard to economic development, environmental protection, and globalization. According to Midmore (1991), in spite of its weaknesses such as relying on linear, average relationships, input-output analysis remains an effective method on explaining intersectoral economic relationships (pp. 19-20).

In a pioneering work, Chenery and Watanabe (1958) made a comparison of production structure among four countries that were Japan, Italy, the United States and Norway in the light of input-output studies. The interdependence of industries, the similarity degree among four countries, and the difference of cost structure were examined. After that, Chenery (1980) selected seven semi-industrial economies: Korea, Taiwan, Colombia, Turkey, Yugoslavia, Mexico, Israel; and Japan, Norway, whose production transformation were completed by 1960, to compare the influence of trade and policy on economic growth and structure over periods of fifteen years or more.

In terms of economic development, Ranis *et al* (1990) considered linkages in developing countries between agriculture versus non-agriculture with the case study of the Phillipines. They found that it was one of the most economically unbalanced countries in the world. The concentration rate of the industrial sector was the highest in the world, in which 2 percent of the industrial firms contributed to 85 percent of the gross output in the industrial sector. It was the most socially unequal country in the world, where some regions were highly industrially concentrated but some, especially outside Manila, were remarkably poor and under-developed. Then they concluded that to decentralize industrialization and modernization, improve infrastructure and decrease unequal distribution of incomes as well was vital factors in the initial development process, aiming at increasing the agricultural output, employment and incomes to improve both agriculture along with non-agriculture.

Another example is Hill (1992), who put Indonesia‘s textile and garment industries under consideration to observe its growth, structural change. “Two policies were critical to the rapid growth of exports: exchange rate management and trade reform” (Hill 1992, p. 67).

Akita (1991) analyzed the structure of industries and industrial growth sources in Indonesia during 1971-1985. Zakariah and Ahmad (1999) examined the industrial output growth sources of Malaysia during the period of 1978-1987. All of them relied on the factor decomposition method proposed by Chenery (1960).

Following closely Akita (1991), Hayashi (2004) used four input-output tables of 1985, 1990, 1995, 2000 in an effort to analyze structural change in industry and trade in Indonesia between the years 1995 and 2000. This is a striking period marked by the 1997 Asian financial crisis and the Suharto regime collapse as well. The author aggregated 160 to 180-sector tables into 41-sector tables, of which 38 sectors from codes 3 to 40 belong to industrial sector with the aim at giving emphasis to Indonesia ‘s industrialization process. The Skyline chart analysis, industrial linkage analysis and growth factor decomposition method were employed, showing that the share of agriculture and service industries shrunk while the manufacturing industry expands its share, in which resource-intensive group still dominates most sectors. He also found that export demand and domestic demand are a driving force of economic growth whereas investment is a negative factor. Therefore it is necessary to improve the investment environment to attract a great influx of FDI.

2. In Vietnam

There appear numbers of researches tracing out structural change and sources of output growth in Vietnam.

Ngoc, Trinh and Thanh (2007) employed three Input-Output tables of 1989, 1996, 2000 to realize the Vietnamese economic performance after its reunification (1976-2000), especially in the period of 1986-2000. This is a very beginning effort in Vietnam to utilize the model of multi-sectoral dynamic Input-Output to quantify the impact of structural change under three aspects: domestic final demand, international trade structure and technological change, on the Vietnamese economy. Gross output multipliers, income multipliers, employment multipliers, consumption, investment and export multipliers served as input-output multipliers to indicate the shift in structure. In terms of income multipliers, that labour income generated was consistently the highest in the sector of manufacturing showed that there was a trend of shifting this sector to a labour intensive one. Moreover, to employment multipliers, the high rate of multipliers in most sectors again stated the common change of most sectors to labour intensive sectors. With regards to consumption, investment and export multipliers, if induced effect was concerned, domestic consumption influenced the total gross output most greatly. Additionally, the outer impacts calculated from competitive type of output multipliers versus non-competitive type of output multipliers in all sectors were not less than 1.2 showing the extension of international trade. As a result, Ngoc, Trinh and Thanh came to a conclusion that Vietnam ‘s economic integration and its domestic final demand play a role of greatest vitality in Vietnamese economic growth.

Besides Ngoc, Trinh and Thanh (2007), Akita and Hau (2006) investigated structural changes and sources of output growth in Vietnam in comparison with Indonesia and Malaysia. As a method of analysis, extended growth-factor decomposition was employed, finding that the expansion of exports contributes remarkably to Vietnamese economic growth, especially the mining, textile & wearing appearel industries. Additionally, the secondary sector also plays important role in economic growth. Unlike Vietnam, in Indonesia and Malaysia, heavy industries

contribute remarkably to growth, , but that of Indonesia makes more contribution to growth than Malaysia. The tertiary sector of Indonesia is a main source of its economic growth. Furthermore, Vietnam is the most agriculturally-based economy among three nations. Their paper showed that increasing international competitive power and the successful open door policy constitute vital factors of export expansion. There also appears a shift from agricultural to non-agricultural production in all countries concerned. Consequently, it is necessary to diversify export performance as well as to strengthen linkages among the primary, secondary and tertiary sectors in registering a higher rate of economic growth.

Trinh *et al* (2007) exploited demographic-economic modeling using the social accounting matrix (SAM) extended from the input-output table by Richard Stone. The value added of production was decomposed into net incomes from capital and net incomes from labour. Also the net income from labour was decomposed into rural and urban ones. They found that income diverted to rural household having the highest income multiplier, thus making a contribution to reducing poverty and lessening incomes inequality. Such industries as rude oil, electricity, petroleum, gas, water, finance, banking, sciences as well as telecommunications create more incomes for rural labour than for urban one. In addition, Vietnam should take its comparative advantage of food processing and sugar industries.

Before these researches, Tarp *et al* (2002) also used Vietnam ‘s SAM database, in which 30 activity and commodity categories were aggregated from 97 ones and 13 trading partners were aggregated from 88 ones, indicating that the primary sector played an important role; the agricultural industry was potentially able to expand; export concentrated on the industrial sector (textile, apparel); such goods as rice were not exploited all their high competitive power showing

Vietnam ‘s low global market penetration. Besides this, to improve education and the labour market made a great contribution to Vietnam‘s economic growth.

However, none of the above studies covered such a long period from 1986 till now to make a detailed examination of structural changes in industry and trade in the new context of Vietnam.

CHAPTER IV: STRUCTURAL CHANGES IN VIETNAMESE INDUSTRIES AND TRADE: AN INPUT-OUTPUT ANALYSIS

I	The industrial and trade structural changes in Vietnam
II	Growth factor changes

I. The industrial and trade structural changes in Vietnam

1. The industrial and trade structural changes: A skyline analysis

What are Vietnamese structural changes in industry and also trade during 1986-2005? This part using Vietnamese input – output tables looks closely at the industrial and trade structural changes through this period. To do this, all sectors of the economy as a whole are aggregated into 16 sectors.

Table 4.1: Sector classification and Aggregation

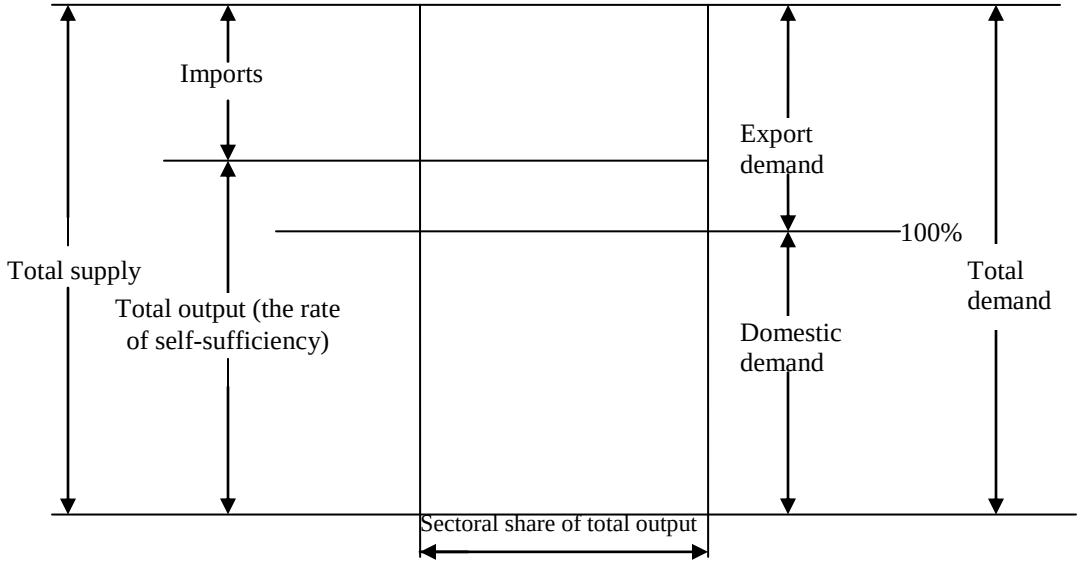
Code	Description	Code 2005	Code 2000	Code 1996	Code 1989
1	Agricultural crops, livestock & poultry, agricultural services	01-12	01-12	01-10	37,38
2	Fishery	14,15	14,15	12	24
3	Forestry	13	13	11	39
4	Mining and quarrying	16-21	16-21	13-17	2-4
5	Food, beverage & tobacco manufactures	2-36	2-36	18-30	23;25-31
6	Other consumer goods	43-44;51;53-54; 75-85	43-44;51;53-54; 75-85	33-34;43;45; 61-71	20-21;14;13; 32-34;36-47
7	Industrial materials	37-42;45-50;52; 55-59;73-74;86	37-42;45-50;52; 55-59;73-74;86	31-32;35-38;39-42;44;46-49;59-60;72-73	17-19;22;10-11;12;15-16; 5-6;55
8	Capital goods	60-72	60-72	50-58	7-9
9	Electricity, gas & water	87-88	87-88	74-76	1;35
10	Construction	89-90	89-90	77	40
11	Wholesale and retail trade	91	91	78	44;46
12	Transport services	95-98	95-98	81-84	41;42
13	Post and telecommunication	99	99	85	43
14	Finance, insurance, real estate & business services	101-104	101-104	87-89	48;50

15	Other private services	92-94;100;105;106;112	92-94;100;105;106;112	79-80;86;90;96;97	53;45;52
16	Government services	107-110;111	107-110;111	87-89	48;50

Source: GSO.

Indirect linkage effects, which encourage intermediate goods transactions, and also the direct ones as an industry‘s output changes are indispensable factors to perceive changes in industrial and trade structure. As can be seen below, skyline charts help explore indirect and direct linkage effects by looking at imports, exports as well as domestic demand of each industrial activity. With the view of drawing skyline charts, all current prices in four Input-Output tables of 1989, 1996, 2000, 2005 are transformed into 1994 constant prices.

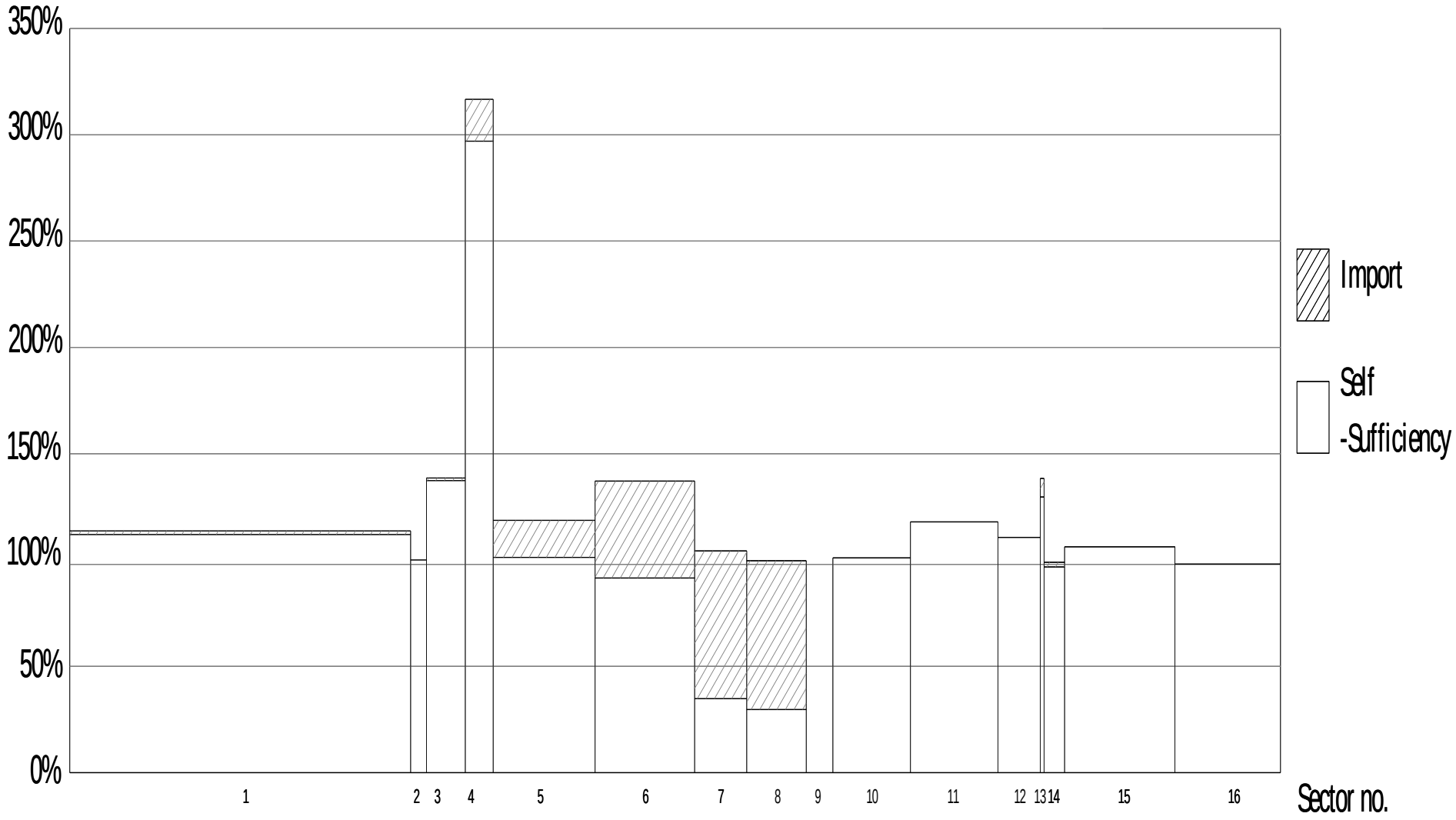
Figure 4.1: Skyline chart construction



The above figure tells us the way to grasp the meaning of skyline charts. Each column‘s width serves as total output share of each industry. Each column‘s height stands for the share of domestic demand in total demand (or total supply), in which domestic

demand is always manifested as 100 percentage point. On the right - hand side, total demand is divided into domestic demand and export demand. And on the left, total supply is composed of imports and total output. The two sides are equal.

Figure 4.2: Skyline chart for the Vietnamese economy in 1989 (2000 prices)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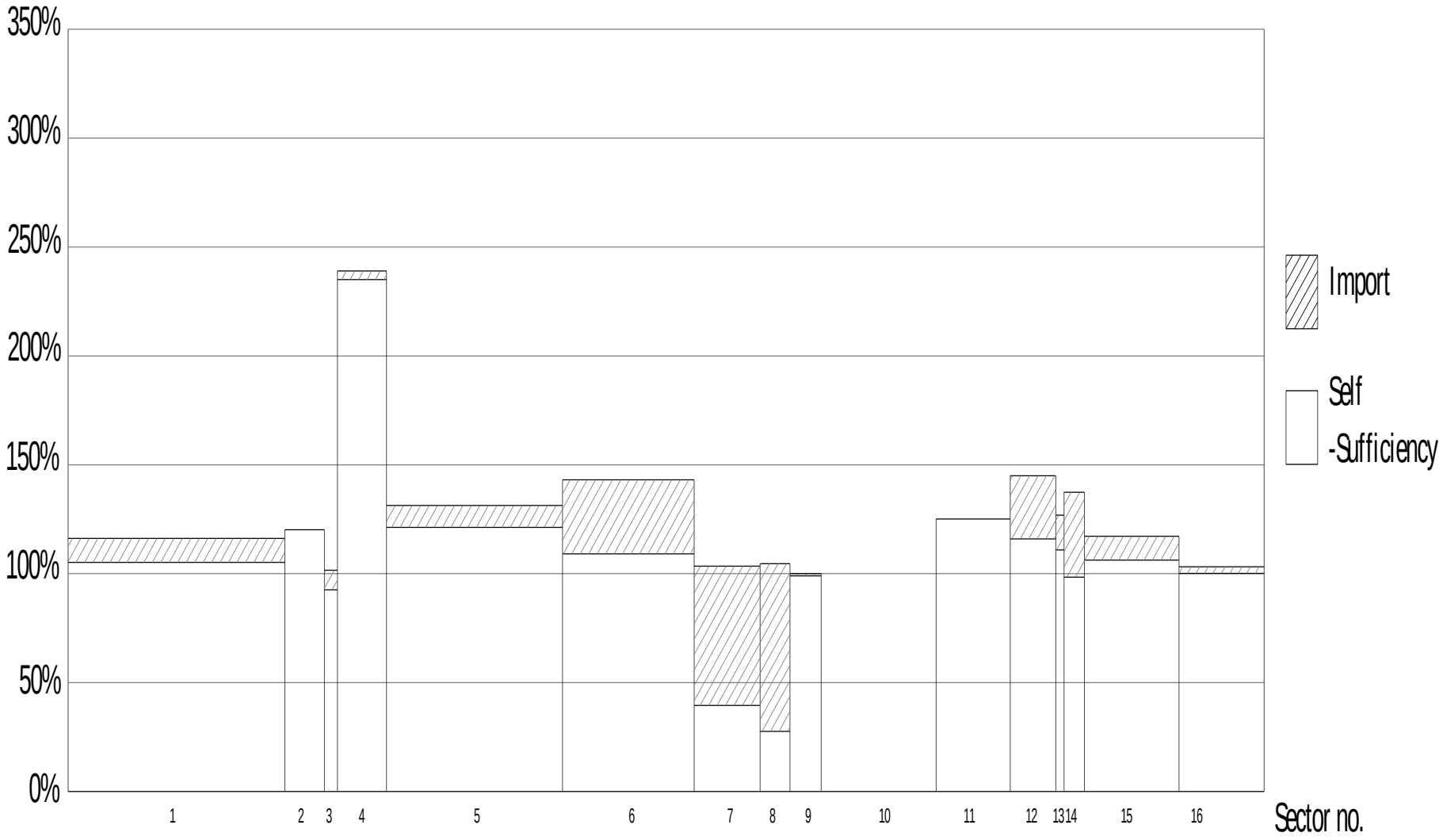
-Sufficiency

Figure 4.3: Skyline chart for the Vietnamese economy in 1996 (2000 prices)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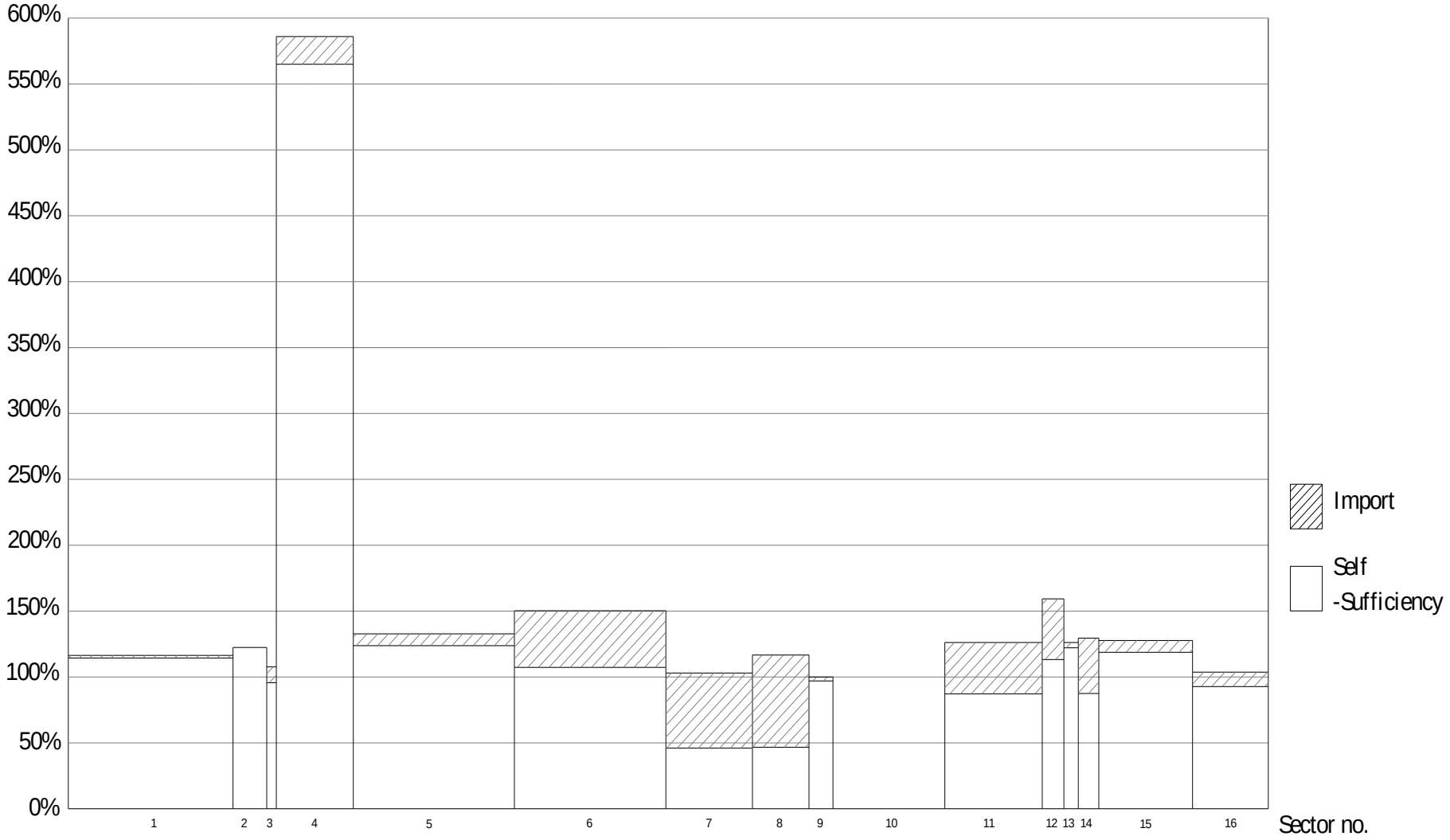
-Sufficiency

Figure 4.4: Skyline chart for the Vietnamese economy in 2000 (2000 prices)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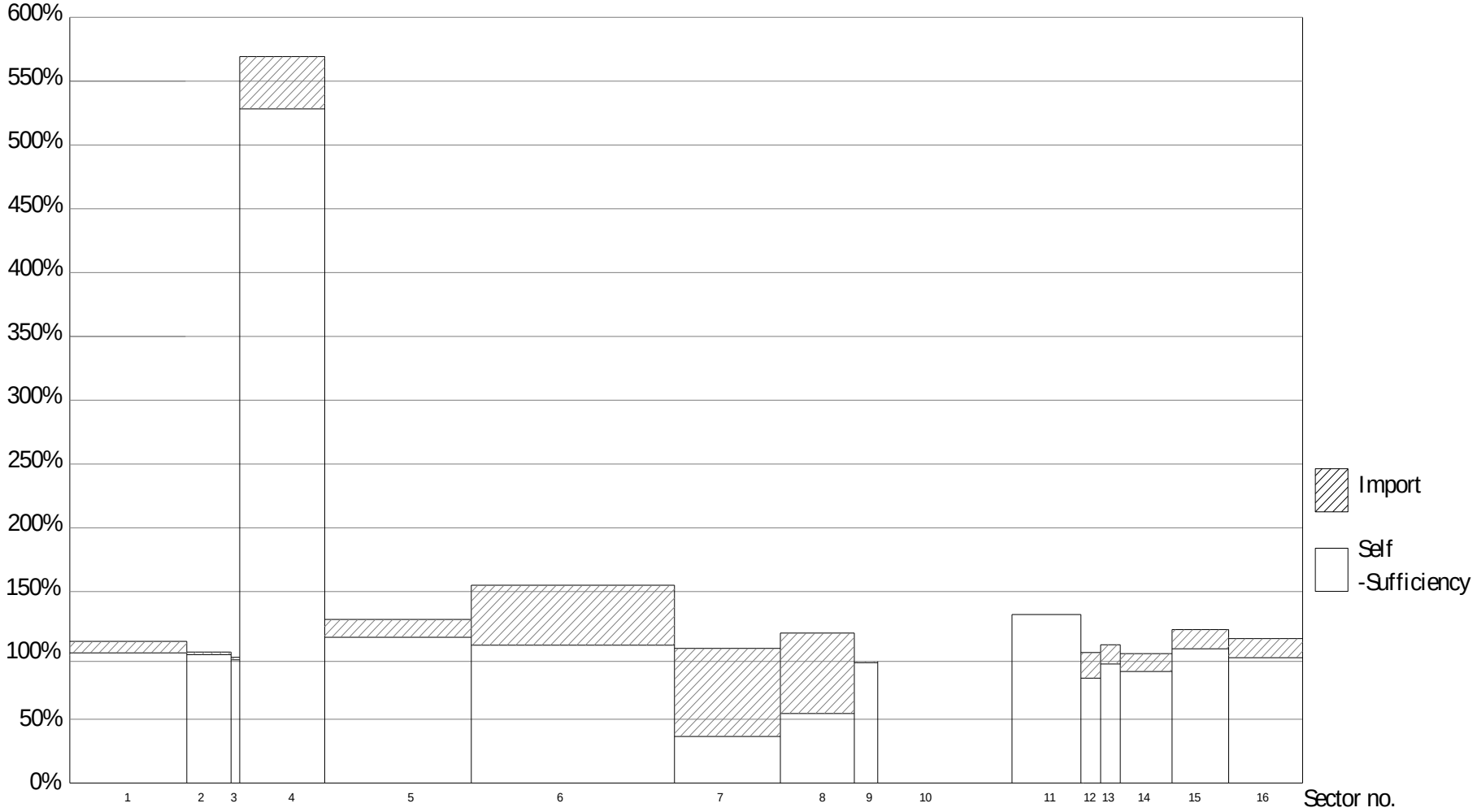
Self
-Sufficiency

Figure 4.5: Skyline chart for the Vietnamese economy in 2005 (2000 prices)



The figure 4.2 indicate that the highest production share of 28.1% in 1989 belonged to Agricultural crops, livestock & poultry, agricultural services (sector no. 1). However, the share of this sector obviously fell from 28.1% of total gross output in the economy as a whole in 1989 down to 18.1% in 1996, 13.7% in 2000 and continuously down to 9.5% in 2005. This fact can be well explained by looking at annual rate of averaged gross output growth (see Table A11). Over the period of 1989-1996, while such other sectors as Post and telecommunication (sector no. 13), Fishery (sector no. 2), Mining and quarrying (sector no. 4), Food, beverage & tobacco manufactures (sector no. 5) boosted strongly (with their respective growth rates of 33.2% p.a, 31.6% p.a, 24.8% p.a, 24.6% p.a), Agricultural crops, livestock & poultry, agricultural services (sector no. 1) grew very slowly (only 8.5% p.a, much lower than annual averaged growth rate of the whole economy of 15.1% p.a). Moreover, this sector could no longer maintain this averaged growth rate in the two following periods but contiuously winded down (at 5.4% p.a in 1996-2000, and only 3.0% p.a in the 2000-2005 period).

Other consumer goods (sector no. 6) enjoyed its share non-stop growing, rising up as the sector with the highest share of total gross output in the economy in 2005 (from 8.2% in 1989, to 11.0% in 1996, to 12.6% in 2000 and up to 16.5% in 2005). This result came in sight thanks to its high and stable growth rates (20.0% p.a in the period of 1989-1996, 16.9% p.a in both 1996-2000 and 2000-2005). Following Other consumer goods (sector no. 6) in 2005 was, in terms of production share, Food, beverage & tobacco manufactures (sector no. 5) with its share of 11.9%.

Forestry (sector no. 3) had the lowest share in 2005 (only 0.7%). Although Post and telecommunication (sector no. 13), Finance, insurance, real estate & business services (sector no. 14), Fishery (sector no. 2), and Mining and quarrying (sector no. 4) recorded in 1989 as sectors whose shares were lower than that of Forestry (sector no. 3), the shares of these sectors in the year of 2005 were all 2

to 6 times higher than Forestry. In general, Post and telecommunication (sector no. 13), Finance, insurance, real estate & business services (sector no. 14), Mining and quarrying (sector no. 4) and Fishery (sector no. 2) all expanded their production shares over time. In which that of Finance, insurance, real estate & business services (sector no. 14) sky-rocketed from 1.7% in 2000 to 4.2% in 2005, owing to the highest annual gross output growth rate of this sector in the period of 2000-2005 (32.6% p.a).

With the similar trend, Construction (sector no. 10) and Industrial materials (sector no. 7) were very likely to register higher and higher production share. Basically, these were also sectors whose gross output growth were higher than that of the economy as a whole. Looking at Capital goods (sector no. 8), from 1996 to 2005, this sector increased its share from 2.5% in 1996 to 4.7% in 2000 and up to 6.0% in 2005. This is owing to high gross output growth rates in the two following periods of 1996-2000 and 2000-2005, especially the highest rate of 32.8% among all sectors in 1996-2000. These high growth rates contrasted with the growth rate of this right sector in the previous period of 1989-1996 (4.3% p.a, the lowest positive growth rate in 1989-1996), making capital goods (sector no. 8) decrease its share in this period (from 4.9% in 1989 down to 2.5% in 1996).

Unlike the widening-trend Post and telecommunication (sector no. 13), Finance, insurance, real estate & business services (sector no. 14), Mining and quarrying (sector no. 4), Fishery (sector no. 2), Construction (sector no. 10) and Industrial materials (sector no. 7) as indicated above, Other private services (sector no. 15), Government services (sector no. 16), Transport services (sector no. 12), Wholesale and retail trade (sector no. 11) and Electricity, gas & water (sector no. 9) all contracted their production share over time. Remarkably, Transport services (sector no. 12) and Other private services (sector no. 15) experienced periods of negative growth rates (Transport services grew at -5.7% p.a in the 1996-2000 period and Other private services at -0.5% p.a in 2000-2005).

With regard to the rate of export to domestic demand, Mining and quarrying (sector no. 4) strikingly registered the highest rate among all sectors in 1989-1996. Additionally, this rate incline to advance from 1996 to 2005. According to GSO (2008f), coal ranked the second following crude oil in the list of Vietnamese main exports. In 2005, exports in Mining and quarrying made up 21.6% of exports as a whole (see Table A6). This large export figure was chiefly supported by self-supply. Really so, mining and quarrying's rate of import to total supply achieved highest in 2005 (twice more than that in 2000), yet at only a modest rate of 7.2% (see Table A9). This prominent rate of export to domestic demand partially revealed the general picture of Vietnamese exports: Vietnam exported mainly natural resources and raw materials.

In 2005, following Mining and quarrying (sector no. 4) in terms of high rate of export to total demand was Other consumer goods (sector no. 6). This was a sector with both export and import rates high but in general, there existed excess of exports over imports. Then were Wholesale and retail trade (sector no. 11), Food, beverage & tobacco manufactures (sector no. 5) and Other private services (sector no. 15), whose rates of export tototal demand always improved during the period the research has covered.

Electricity, gas & water (sector no. 9) was the only sector without exports over 1989-2005. Although in 1989, rates of export to total demand of Fishery (sector no. 2) and Government services (sector no. 16) were negligible, these rates were significantly improved in the following years. Particularly, that of Government services (sector no. 16) considerably increased (from 0.1% in 1989 up to 15.1% in 2005).

Forestry (sector no. 3) had its rate of export to total demand lowest among 16 sectors in 2005 (3.1%), which decreased more than 9 times compared with in 1989. This was due to poor management of forestal resources, leading to indiscriminate exploitation and usage

of these resources. Deforestation and timber smuggling remained a big problem to Forestry (sector no. 3). Besides this, reforestation was not effectively deployed. If forestal exploitation did not go with afforestation and forestal improvement, forestal quality and area would reduce, causing environmental deterirating and lessening production for too long.

Although Vietnam ranked as the first exporter of pepper, cashew nuts, the second exporter of rice, coffee, Agricultural crops, livestock & poultry, agricultural services (sector no. 1) had the rate of export to domestic demand not high, broadly lower than that of the whole economy. Export values were low since agricultural export products were mainly raw and unprocessed. In 2005, exports in this sector accounted for only 4.9% total export value in the entire economy (see Table A6).

Regarding to imports, as can remarkably be seen in figures 4.2, 4.3, 4.4, 4.5, Industrial materials (sector no. 7) and Capital goods (sector no. 8) owned the uppermost rates of import to total supply. However, in all, the proportions of export to domestic demand of both sectors were very insignificant. The heavy reliance on import of Industrial materials (sector no. 7) and Capital goods (sector no. 8) proved immaturity of auxiliary industries in Vietnam.

Electricity, gas & water (sector no. 9) basically had positive rates of import to total supply in spite of the fact that they were low. Wholesale and retail trade (sector no. 11) did not import in the years of 1989, 1996, 2005 while its imports was considerable in 2000 (with the rate of import to total supply of 31.0%). Forestry (sector no. 3) and Fishery (sector no. 2) owned the lowest rates of import to total supply in 2005.

Overall, in terms of exports and imports, the rates of import to total supply and of export to total demand increasingly picked up (11.5%, 15.9%, 20.1% and 21.3% with regard to the rate of export to total demand, and 20.4%, 20.2%, 22.6%, 24.9% with regard to

the rate of import to total supply, in respective years of 1989, 1996, 2000, 2005; also see Tables A8, A9), showing Vietnam integrated more and more into the world. Although the data indicated that export growth rates on a year-over-year basis were higher than import one, except for the 2000-2005 period the import grew little faster than export (see Table A12, A13), there always existed excess of imports over exports. In 1989, 1996, 2000, 2005 these respective figures were 23.95 billion VND, 30.68VND, 29.11 billion VND and 74.02 VND.

As shown above, the Skyline analysis using Input-Output tables of 1989, 1996, 2000, 2005 shows structural changes in the Vietnamese economy within the period of 1989-2005. In all, there existed a general trend to shift the economy from agriculture to industries and services. That mining and quarrying (sector no. 4) served as the strongest export oriented sector, in contrast, Industrial materials (sector no. 7) and Capital goods (sector no. 8) were the greatest import dependency partially revealed backward import-export structure, in which the tendency of export of raw, unprocessed products with low values versus import of high technique goods with high values necessary for production activities were reinforced. Thus there appeared excess of imports over exports. Additionally, a huge export of raw materials exhausted natural resources. Vietnam indispensably directs more to foreign markets of processed and manufacturing goods as well as diversifies its export partterns. Besides this, technique improvement to produce such goods as industrial materials and capital goods with high-quality as substitutes for imports was a prerequisite condition in an attempt to reduce trade deficit.

2. Industrial linkage effects

Industrial structure and economic development are very likely influenced by industrial linkage effects. Activities of production in one industry may directly and indirectly encourage that in other industries. As noted by Hirschmann (1958), the effects which give support to downstream sectors were called "forward linkage effects", in contrast, those which foster production development in upstream sectors were called "backward linkage effects". The final demand growth in one sector of strong forward and backward linkages will help boost production and therefore advance the economy as a whole.

TABLE 1

BACKWARD AND FORWARD LINKAGE EFFECTS OF VIETNAMESE ECONOMY

		Backward linkage effects (Index of dispersion power)				Forward linkage effects (Degree of sensitivity index)			
		1989	1996	2000	2005	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	0.85646	0.78199	0.78164	0.71693	0.94995	1.01539*	0.85025	0.78349
2	Fishery	1.03461*	0.79679	0.94977	0.83806	0.60511	0.59710	0.51448	0.53565
3	Forestry	0.74593	0.67270	0.67140	0.56959	0.65713	0.72509	0.55051	0.50792
4	Mining and quarrying	0.96296	0.98207	0.71243	0.75116	1.00933*	0.90080	0.66734	0.72248
5	Food, beverage & tobacco manufactures	1.26905*	1.17974*	1.22640*	1.21685*	0.93943	0.60793	0.59465	0.60155
6	Other consumer goods	1.20869*	1.34205*	1.44806*	1.53915*	1.42825*	1.43494*	1.47813*	1.89614*
7	Industrial materials	1.35663*	1.30844*	1.31988*	1.32846*	3.06055*	2.88036*	3.53142*	4.53697*
8	Capital goods	1.00469*	1.47196*	1.41907*	1.58904*	1.76133*	1.72825*	1.86903*	1.76415*
9	Electricity, gas & water	1.09600*	1.04513*	0.79356	0.89971	0.97884	0.91269	0.76249	0.74809
10	Construction	1.13358*	1.29119*	1.36347*	1.20731*	0.57573	0.61224	0.50581	0.56275
11	Wholesale and retail trade	0.75393	0.75586	1.00141*	0.92542	0.87843	0.94358	1.51804*	0.65012
12	Transport services	0.98710	0.91499	1.02611*	1.19932*	0.73004	0.91726	0.57076	0.53801
13	Post and telecommunication	0.92807	0.98583	0.74505	0.69119	0.50654	0.65008	0.55487	0.54608
14	Finance, insurance & real estate & business services	0.96293	0.76908	0.81402	0.77504	0.66979	0.69195	0.68472	0.65945
15	Other private services	0.82311	0.82966	0.86423	0.88469	0.71461	0.83959	0.86474	0.49117
16	Government services	0.87626	0.87251	0.86349	0.86807	0.53491	0.54275	0.48277	0.45598

* indicates strong interindustrial linkage effects

From table 1, index of dispersion power and degree of sensitivity index are used to measure backward and forward linkage effects. The former can be attained by taking the quotient of the sum of the jth column of the inverse matrix to the industry average. The later is obtained by taking the quotient of the sum of the ith row of the inverse matrix to the industry average. The degree greater than 1, which is marked with a star-shape figure (*) in the table, shows a sector of high forward or backward linkages.

As can be seen in table 1, a lot of industries were in one of three groups. A sector with strong forward linkage effects belonged to group 1 including primary products used for intermediate input, which were Agricultural crops, livestock & poultry, agricultural services (sector no. 1) and Mining and quarrying (sector no. 4). Group 2 was made up of sectors creating industrial goods and services for intermediate input with strong effects of backward and forward linkage, which were Industrial materials (sector no. 7), Capital goods (sector no. 8), Other consumer goods (sector no. 6), Wholesale and retail trade (sector no. 11). Particularly, Industrial materials (sector no. 7) had extremely strong forward lingkes. Then were Capital goods (sector no. 8) and Other consumer goods (sector no. 6), whose backward and forward linkages were also strong and rather stable over time. Group 3 were Fishery (sector no. 2), Food, beverage & tobacco manufactures (sector no. 5), Electricity, gas & water (sector no. 9), Construction (sector no. 10), Transport services (sector no. 12), which were producing industrial products for final demand with strong effects of backward linkage. However, to the electricity alone, the production process of electricity was a practically uneffective sector in Vietnam, wasting a big amount of electrical energy on feeders. Thus, in fact, Electricity, gas & water (sector no. 9) must not have strong backward linkages yet.

From 1986-2005, many sectors as Forestry (sector no. 3), Post and telecommunication (sector no. 13) were not likely to have strong neither backward nor forward linkage effects. Then were

Finance, insurance, real estate & business services (sector no. 14), Other private services (sector no. 15) and Government services (sector no. 16). If such sectors as Post and telecommunication (sector no. 13) and Finance, insurance, real estate & business services (sector no. 14) with high annual gross output growth rates had been more powerful forward and backward linkage effects, they would have succeeded in pushing up production and accelerating more robust economic growth. Increase in domestic supply taking the place of import as well as improvement of technological change is a good method to promote interindustrial linkage.

II. Growth factor changes

1. Analysis of growth factor decomposition

This section will present results of calculation derived from the growth factor decomposition method mentioned in the theoretical framework. This produces a quantitative analysis from the demand side for the period of 1986-2005, in which sources of output changes will be identified. In brief, output changes will be explained by five factors: import substitution (IS), technological change (TC), final consumption (FC), investment (FI) and export expansion (EE) as follows:

Changes in output = IS + TC + FC + FI + EE.

2. Sources of output growth in Vietnam: 1986-2005

TABLE 2

Sources of output growth in Vietnam (annual average growth rate): 1989-1996

			Growth factor decomposition					
					Domestic final demand			
		growth rate(%)	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	8.1	-1.4	1.9	3.8	0.3	4.1	3.5
2	Fishery	31.6	0.7	-4.0	23.9	0.4	24.3	10.7
3	Forestry	-1.0	-0.4	2.1	-2.9	0.9	-1.9	-0.8
4	Mining and quarrying	24.8	1.6	0.6	1.4	5.3	6.8	15.7
5	Food, beverage & tobacco manufactures	24.6	1.4	-4.2	18.5	0.5	19.0	8.5
6	Other consumer goods	20.0	2.4	0.0	5.3	1.6	7.0	10.7
7	Industrial materials	19.0	2.4	0.4	4.3	6.6	10.9	5.3
8	Capital goods	4.3	-4.1	-1.3	2.7	2.8	5.5	4.2
9	Electricity, gas & water	18.2	0.2	1.3	8.7	2.9	11.6	5.2
10	Construction	22.0	0.0	0.0	-0.5	22.2	21.8	0.2
11	Wholesale and retail trade	12.5	0.0	3.4	1.5	2.5	4.0	5.1
12	Transport services	16.5	-4.2	5.5	1.2	2.9	4.1	11.0
13	Post and telecommunication	33.2	-1.7	12.6	9.7	1.5	11.1	11.2
14	Finance, insurance, real estate & business services	15.0	-6.2	0.5	7.1	1.6	8.6	12.0
15	Other private services	12.8	-1.8	1.0	9.2	0.5	9.7	4.0
16	Government services	11.9	-0.5	0.6	10.9	0.1	11.0	0.9
		15.1	-0.4	0.5	6.4	3.1	9.5	5.4

TABLE 3

Sources of output growth in Vietnam (annual average growth rate): 1996-2000

			Growth factor decomposition					
					Domestic final demand			
		growth rate(%)	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	5.4	2.2	-1.8	1.7	0.7	2.4	2.5
2	Fishery	7.8	0.0	0.1	4.1	0.3	4.4	3.3
3	Forestry	4.8	-1.8	-7.9	3.2	0.8	4.1	10.4
4	Mining and quarrying	26.3	-0.8	-3.8	0.2	1.7	1.9	29.0
5	Food, beverage & tobacco manufactures	10.4	0.1	1.3	4.5	0.9	5.3	3.6
6	Other consumer goods	16.9	-3.0	2.3	4.2	0.3	4.5	13.0
7	Industrial materials	20.9	5.1	3.5	1.6	4.5	6.1	6.3
8	Capital goods	32.8	6.1	3.3	0.2	4.8	5.0	18.4
9	Electricity, gas & water	6.2	-0.8	-7.6	5.8	1.9	7.6	7.0
10	Construction	12.2	-0.1	-0.5	0.3	12.1	12.4	0.5
11	Wholesale and retail trade	21.1	-11.8	10.9	7.8	2.5	10.3	11.8
12	Transport services	-5.7	-5.0	-10.8	4.6	1.3	5.9	4.3
13	Post and telecommunication	27.0	2.0	6.0	5.5	1.0	6.5	12.5
14	Finance, insurance, real estate & business services	13.7	-1.9	-0.5	7.6	0.7	8.3	7.8
15	Other private services	12.7	-0.2	1.7	3.5	0.5	4.0	7.2
16	Government services	9.4	-2.4	-0.6	11.5	0.1	11.6	0.8
		13.0	-0.7	0.6	3.7	2.3	6.0	7.1

TABLE 4

Sources of output growth in Vietnam (annual average growth rate): 2000-2005

			Growth factor decomposition					
					Domestic final demand			
		growth rate(%)	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	3.0	-1.9	-0.9	3.1	0.4	3.6	2.2
2	Fishery	16.9	-0.9	5.7	10.8	0.4	11.2	0.8
3	Forestry	6.9	1.6	-3.5	-0.5	0.6	0.1	8.7
4	Mining and quarrying	12.4	-1.1	0.3	0.4	0.6	0.9	12.3
5	Food, beverage & tobacco manufactures	8.1	-1.0	1.4	4.0	0.7	4.7	3.0
6	Other consumer goods	16.9	-1.1	2.1	1.9	0.2	2.1	13.8
7	Industrial materials	14.7	-7.6	2.8	2.7	6.0	8.7	10.8
8	Capital goods	16.3	3.7	-0.6	2.4	2.4	4.8	8.5
9	Electricity, gas & water	8.6	-0.5	-0.1	1.3	2.0	3.3	5.9
10	Construction	14.3	0.2	1.1	0.2	12.5	12.6	0.3
11	Wholesale and retail trade	2.8	6.9	-12.8	1.3	4.7	6.0	2.6
12	Transport services	7.2	5.5	-0.5	3.2	4.1	7.3	-5.2
13	Post and telecommunication	17.9	-2.6	2.1	12.3	0.8	13.1	5.2
14	Finance, insurance, real estate & business services	32.6	9.2	1.9	19.7	0.7	20.4	1.1
15	Other private services	-0.5	-0.5	-6.5	5.0	0.6	5.6	0.8
16	Government services	9.7	-1.0	0.1	6.4	0.0	6.4	4.2
		10.8	-0.3	-0.4	3.4	2.6	6.0	5.4

TABLE 5

Sources of output growth in Vietnam (changed output on average): 1989-1996

			Growth factor decomposition					
					Domestic final demand			
		changed output	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	6204895	-1086761	1432574	2938333	229930	3168263	2690818
2	Fishery	2307485	50936	-293468	1739879	29834	1769713	780304
3	Forestry	-63956	-25493	139926	-187576	60111	-127466	-50923
4	Mining and quarrying	2625725	174681	63292	152605	565830	718435	1669317
5	Food, beverage & tobacco manufactures	9402346	532314	-1607122	7058654	189230	7247884	3229270
6	Other consumer goods	6441336	765110	-4517	1718727	522618	2241345	3439399
7	Industrial materials	3149008	397801	64226	705818	1098391	1804209	882771
8	Capital goods	505616	-487755	-156832	317573	332234	649808	500395
9	Electricity, gas & water	1473416	13945	104064	702046	234991	937037	418370
10	Construction	5863989	-2522	4795	-125381	5933255	5807875	53842
11	Wholesale and retail trade	2810496	-3087	763496	344364	556495	900859	1149228
12	Transport services	2027745	-512790	677959	151157	354020	505177	1357399
13	Post and telecommunication	513773	-25837	194505	149298	22803	172101	173005
14	Finance, insurance, real estate & business services	845802	-348570	28869	399534	87755	487289	678214
15	Other private services	3670697	-516715	278312	2621902	153093	2774995	1134105
16	Government services	3153426	-133404	149098	2883981	26282	2910263	227469
		50931801	-1208147	1839178	21570916	10396871	31967786	18332984

TABLE 6

Sources of output growth in Vietnam (changed output on average): 1996-2000

			Growth factor decomposition					
					Domestic final demand			
		changed output	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	3455489	1432093	-1134295	1076738	461323	1538061	1619630
2	Fishery	951962	6007	7749	498022	37103	535125	403081
3	Forestry	185557	-68563	-303927	125117	32773	157890	400157
4	Mining and quarrying	5144288	-155869	-743923	45504	323649	369153	5674927
5	Food, beverage & tobacco manufactures	5802969	79811	729591	2504199	477022	2981221	2012346
6	Other consumer goods	7727026	-1353122	1056415	1913571	134917	2048488	5975245
7	Industrial materials	5092438	1243498	839947	387276	1092666	1479942	1529052
8	Capital goods	4213554	778307	425918	30106	615711	645818	2363511
9	Electricity, gas & water	581158	-71507	-715038	539846	173576	713422	654282
10	Construction	4550147	-43359	-202337	101146	4522269	4623415	172427
11	Wholesale and retail trade	5772244	-3221540	2973529	2122868	680205	2803073	3217181
12	Transport services	-645844	-572576	-1230268	516313	148386	664699	492301
13	Post and telecommunication	950914	72120	212163	194587	33574	228160	438470
14	Finance, insurance, real estate & business services	906779	-129177	-35894	506861	45497	552358	519492
15	Other private services	3947785	-49108	517076	1098052	154632	1252684	2227133
16	Government services	2508274	-632779	-152708	3070743	15441	3086184	207577
		51144740	-2685763	2243999	14730948	8948744	23679692	27906811

TABLE 7

Sources of output growth in Vietnam (changed output on average): 2000-2005

			Growth factor decomposition					
					Domestic final demand			
		changed output	Import substitution	Tech. change	Consumption ©	Investment(I)	C+I	Export
1	Agricultural crops, livestock & poultry, agricultural services	2848145	-1817134	-911044	3038512	410191	3448703	2127619
2	Fishery	4324372	-220442	1468428	2769961	102970	2872931	203456
3	Forestry	432039	97939	-214800	-33076	39983	6906	541993
4	Mining and quarrying	6722360	-621727	174796	205853	308714	514567	6654724
5	Food, beverage & tobacco manufactures	8475653	-1077410	1503259	4161006	776276	4937281	3112523
6	Other consumer goods	19690128	-1301489	2414657	2264963	191135	2456099	16120860
7	Industrial materials	9399557	-4850175	1799989	1729982	3833918	5563900	6885843
8	Capital goods	7029683	1576722	-250132	1012110	1043162	2055272	3647821
9	Electricity, gas & water	1384094	-77166	-17211	210265	315293	525558	952913
10	Construction	11720533	189271	915245	129041	10244109	10373150	242868
11	Wholesale and retail trade	1598600	3954178	-7297062	737660	2699360	3437021	1504462
12	Transport services	1016907	781429	-70914	454143	579907	1034050	-727659
13	Post and telecommunication	1972563	-282280	231494	1359011	90034	1449045	574304
14	Finance, insurance, real estate & business services	7014421	1987909	399384	4241756	152133	4393889	233239
15	Other private services	-270163	-262152	-3315631	2591462	306453	2897915	409704
16	Government services	4862958	-507061	37810	3206316	24237	3230553	2101657
		88221851	-2429586	-3131732	28078965	21117874	49196840	44586329

Figure 4.6: Annual average growth rate

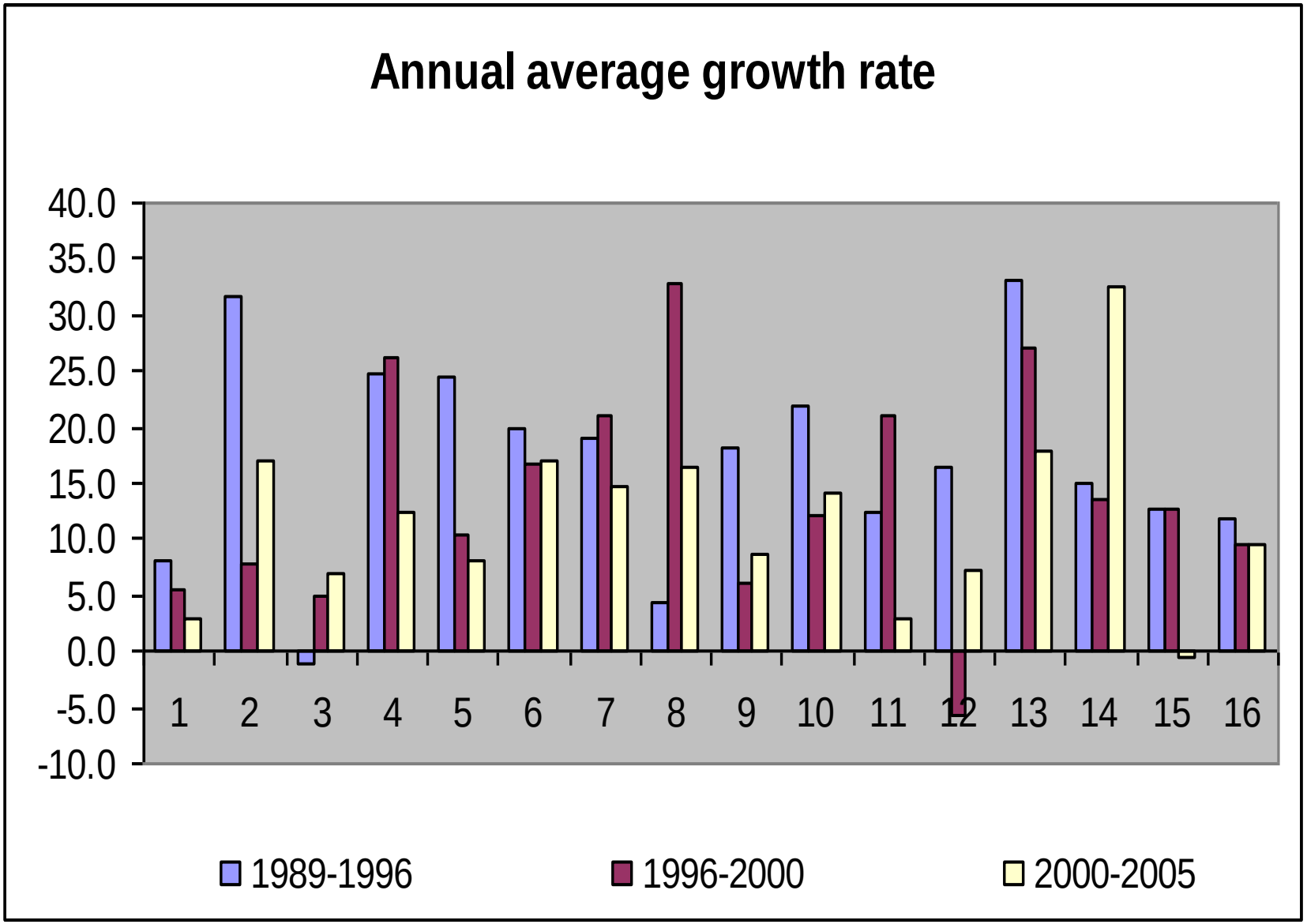
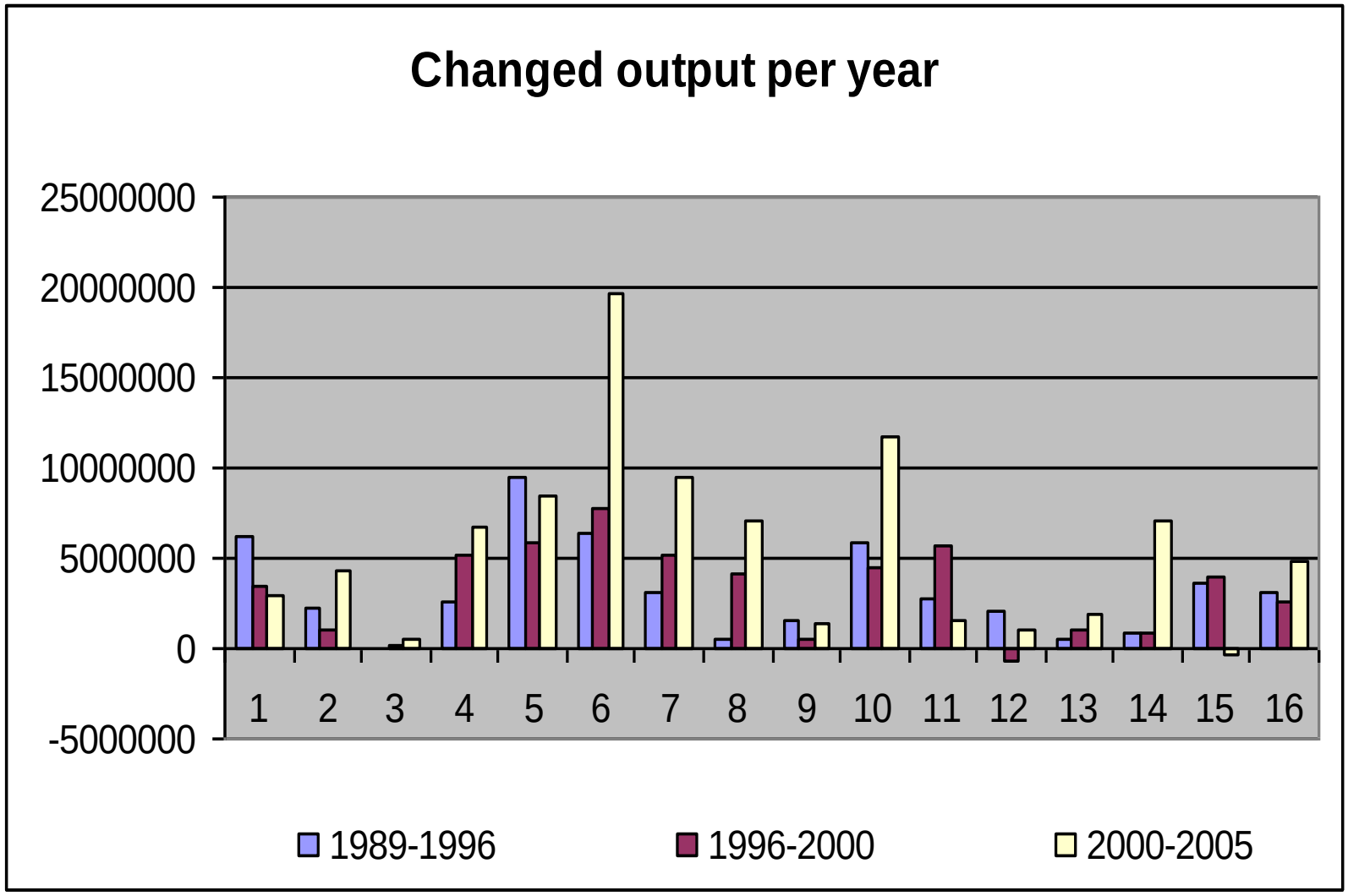


Figure 4.7: Changed output per year



As can be seen from Tables 2, 3, 4, annual averaged gross output growth rate of the economy as a whole gradually decreased during the period covered by the research (from 15.1% in 1989-1996 down to 13.0% in the 1996-2000 period, and to 10.8% in 2000-2005). But the growth rate of 10.8% in 2000-2005 was still a high level. However, looking at changed output per year (at 2000 price), it was very likely that changed gross output per year in the period of 1996-2000 was approximately equal to 1989-1996, while in 2000-2005 that figure boomed more than 1.7 times higher than in 1996-2000. This proved a sluggish period of 1996-2000, after that the 2000-2005 period was a rising up one from the perspective of changed gross output per year. All in all, factors of Consumption, Investment, and Export positively contributed to production growth (with the contribution of Consumption of 6.4%, 3.7%, 3.4% p.a, Investment of 3.1%, 2.3%, 2.6% p.a, and Export of 5.4%, 7.1%, 5.4% p.a in 1989-1996, 1996-2000, 2000-2005, respectively, to the whole economy). In contrast, over the studied period, Import substitution always had a negative impact on production growth of the entire economy (respective -0.4%, -0.7%, -0.3% p.a for each periods of 1989-1996, 1996-2000, 2000-2005). This indicated that domestic supply did not meet the growth of domestic demand (including both intermediate demand and final demand). As regards Technological change, while this factor served as positive in the two previous periods of 1989-1996 and 1996-2000, it held back production growth in 2000-2005.

In each sector, noticeable was Finance, insurance, real estate & business services (sector no. 14). From growing at the annual averaged rate of 15.0% p.a and 13.7% p.a in the previous periods, this sector advanced by 32.0% p.a in 2000-2005, much higher than the growth rate of the following sectors (Post and telecommunication (sector no. 13), 17.9% p.a), Fishery (sector no. 2) and Other

consumer goods (sector no. 6), 16.9% p.a), in which Consumption and Import substitution contributed greatest to production growth (respective 19.7% p.a, 9.2% p.a).

The growth rate of 17.9% p.a belonging to Post and telecommunication (sector no. 13) in 2000-2005 was the lowest production growth rate of this sector in all three periods, despite ranking the second in all 16 sectors' growth in 2000-2005. Post and telecommunication (sector no. 13) led with regard to production growth rate in the first 1989-1996 period (33.2% p.a). This was also the highest growth rate in all periods, in which Technological change, Export and Consumption all served as strong growth factors (12.6% p.a, 11.2% p.a, 9.7% p.a). In 1996-2000, the growth rate of Post and telecommunication (sector no. 13) ranked the second (27.0% p.a). Closely following this rate was that of Mining and quarrying (sector no. 4) (26.3% p.a). Although Import substitution and Technological change of this sector experienced negative growth (-0.8% p.a and -3.8% p.a), this was Export with strong growth (29% p.a, the greatest growth rate of Export in all sectors in 1989-2005) that helped boost Mining and quarrying. This sector ranked the third in 1989-1996 in terms of growth rate (24.8%) greatly thanks to its Export factor (15.7% p.a).

From a sector whose growth rate was lowest positive in the previous period of 1989-1996 (4.3% p.a), Capital goods (sector no. 8) boomed its production to become a sector with a leading growth rate among all sectors in 1996-2000 (32.8% p.a), in which Export played an important role (18.4% p.a). In 2000-2005, Export (with the growth rate of 8.5% p.a) was still the most significant growth factor of this sector (16.9% p.a).

Fishery (sector no. 2) had the second high growth rate among all sectors in 1989-1996 (31.6% p.a), in which Consumption worked as a strong positive factor (23.9% p.a). Additionally, this factor kept playing positively to the growth of Fishery in the two following periods.

While Industrial materials (sector no. 7) advanced at 20.9% p.a in 1996-2000, its growth rate contracted to only 14.7% in 2000-2005 due to the great dissuading factor of Import substitution (-7.6% p.a). This showed that the importation of industrial material as input for production activity had a big negative impact on production growth rate of this sector.

Agricultural crops, livestock & poultry, agricultural services (sector no. 1) had its annual average growth rates always lower than that of the entire economy (8.1% p.a compared with 15.1% p.a in 1989-1996, 5.4% p.a compared with 13.0% p.a in 1996-2000 and 3.0% p.a compared with 10.8% p.a in 2000-2005). The two periods of 1996-2000 and 2000-2005 witnessed the slowdown of this sector because Import substitution and Technological change negatively contributed to its growth (except for the positive growth of 2.2% p.a of Import substitution in 1996-2000), and all remaining factors did not outstandingly stimulated the growth of this sector. Using backward manual production methods, and heavily depending on natural condition were reasons for low productivity of this sector in recent years of 2000-2005 (maintained at a growth of 3.0% p.a, a nearly lowest positive growth rate in this period).

While Wholesale and retail trade (sector no. 11) strongly grew in the two previous periods (12.5% p.a in 1989-1996 and 21.1% p.a in 1996-2000), this sector experienced a drastic slowdown, becoming the lowest growing sector in 2000-2005 (2.8% p.a). On the other hand, Forestry (sector no. 3) gradually improved from a negative rate in 1989-1996 (-1.0% p.a) to positive parttern in the two following periods (4.8% p.a in 1996-2000 and 6.9% p.a in 2000-2005). Transport services (sector no. 12) registered a positive growth rate in 2000-2005 (7.2% p.a) from a negative one in 1996-2000 (-5.7% p.a). That the factor of Technological change had a greatly negative contribution (-10.8% p.a) and Import substitution also recorded as a minus factor (-5.7% p.a) were reasons

making Transport services become the only sector with negative production growth in 1996-2000. Similarly, Other private services (sector no. 15) worked as the only sector with negative growth rate in 2000-2005 (-0.5% p.a), although it grew rather stably in both two following periods (12.8% p.a in 1989-1996 and 12.7% p.a in the 1996-2000 period), due to negative effects of its Import substitution and Technological change (with the respective growth rate of -0.5% p.a and -6.5% p.a).

As regards factors, Consumption, Investment and Export became key factors for growth of the economy as a whole. Consumption and Export boosted growth of all sectors during the studied period, except for the negative impact of Consumption on Forestry (sector no. 3) and Construction (sector no. 10) in 1989-1996 (-2.9% p.a and -0.5% p.a), Forestry (sector no. 3) in the period of 2000-2005 (-0.5% p.a) and the negative impact of Export on Forestry (sector no. 3) in the 1989-1996 period (-0.8% p.a) and Transport services (sector no. 12) in 2000-2005 (-5.2% p.a). In 2000-2005, Consumption grew the most strongly in Finance, insurance, real estate & business services (sector no. 14), contributing much (19.7% p.a) to the highest growth of this sector. On the contrary, that Consumption and Export had a negative impact on Forestry (sector no. 3) well explained why this was the unique sector with negative growth from 1989 to 1996.

Investment always recorded as a positive factor in all sectors. Construction (sector no. 10) always owned the highest - growing Investment, much exceeding that of other sectors. Nearly all growth of this sector was contributed by Investment. In contrast, Government services (sector no. 16) hardly paid special attention to Investment, thus served as a sector with lowest contribution of Investment to growth in all three periods.

In the entire period from 1989 to 2005, Technical change and Import substitution negatively contributed to growth of many sectors. There did not exist any sector, except for Industrial materials

(sector no. 7) and Post and telecommunication (sector no. 13), with a consistently positive effect of Technical change during 1989-2005. However, in general, Technical change stimulated the whole economy in the two previous periods of 1989-1996 and 1996-2000 (respective 0.5% p.a and 0.6% p.a). Among all sectors, this factor contributed the most significantly to Post and telecommunication (sector no. 13) (with the rates of 12.6% p.a and 6.9% p.a, respectively, in 1989-1996 and 1996-2000), working as a driving force for the strong rising up of this sector, especially in the first two periods as analyzed above. But Technological change negatively contributed to gross output of the entire economy from 2000 to 2005 (-0.4% p.a), in which Wholesale and retail trade (sector no. 11) suffered the most from this factor (-12.8% p.a, the greatest negative growth rate among all factors in all sectors). Not to attach special importance to Technological change was a right reason making Wholesale and retail trade (sector no. 11) grow very low in the period of 2000-2005 as indicated above.

There did not appear any sector among 16 ones whose Import substitution served as a consistently strong growth factor during 1989-2005. Import substitution held back growth of the economy in all three periods (-0.4% p.a in 1989-1996, -0.7% p.a during 1996-2000 and -0.3% p.a in 2000-2005), in which Wholesale and retail trade (sector no. 11) suffered worst (-11.8% p.a during 1996-2000), then were Industrial materials (sector no. 7) (-7.6% p.a in 2000-2005) and Finance, insurance, real estate & business services (sector no. 14) (-6.2% p.a in 1989-1996). However, these were Finance, insurance, real estate & business services (sector no. 14) and Wholesale and retail trade (sector no. 11) that owned the most positively-contributing Import substitution to growth among all sectors in the period of 2000-2005 (respective 9.2% p.a and 6.9% p.a), showing that these two sectors much widened their domesitic supply over one unit of domestic demand. This very

factor helped Finance, insurance, real estate & business services become a sector with great advances during 2000-2005 as analyzed above.

In brief, Consumption, Investment and Export Expansion generally played a positive role in economic growth. That Import substitution and Technological change geared up or held back growth depended on each sector and each period. However, Import substitution always had minus impact on the whole economy. There did not appear any among 16 sectors which owned positive factors of Import substitution in all periods. Technological change did not display all its strength in the industrialization and modernization time. That this factor grew negatively in the recent period of 2000-2005 showed that application of new technology to production did not receive the proper care. On the other hand, annual averaged growth rate decreased over time. From the perspective of averaged gross output change, the 1996-2000 period was a sluggish period, then was an improving one.

CHAPTER V: CONCLUSION

I. Conclusion and policy recommendations

II. Limitations and recommendations for further studies

I. Conclusion and policy recommendations

In general, Final Consumption, Investment and Export Expansion are positive sources of growth, which should be continuously promoted. In contrast, the factors of Import substitution and Technological change playing a negative role should be improved. Technological improvement then domestic production expansion, domestic supply increase on each unit of domestic demand will be an indispensable solution. Technological improvement and domestic production expansion will not only help boost that sector's total output but also gear up other sectors through indirect linkage effects. Especially, if Industrial materials (sector no. 7), Capital goods (sector no. 8) and Other consumer goods (sector no. 6) whose backward and forward linkage effects are remarkably significant, are applied technological achievements and maintain their high and stable growth rates as in past years from 2000 to 2005, total output increase in these sectors will dramatically speed up other sectors' growth. On the other hand, Post and telecommunication (sector no. 13) and Finance, insurance, real estate & business services (sector no. 14) register weak forward and backward linkage effects, especially forward linkages, but very high annual averaged growth rates. Therefore, if these two sectors had stronger backward and forward linkages, they would serve as a considerable driving force for other sectors growing. Again, domestic supply increase to replace imports and technological renovation is a very good method to strengthen industrial linkages.

Having the same trend like other developing countries, Vietnam has decreasing share of agriculture, forestry and fishery, making room for industries and services to develop. Besides, it can be seen that Vietnam dominantly exports raw and unprocessed products but imports goods rich in technology. This leads not only to low export value but also exhausts natural resources. For this reason, technological improvement, which helps the structural shift of trade from backward trade structure to forward one, from mainly raw material exports to high-tech ones becomes extremely required to reduce trade gap.

In brief, to foster technological innovation and domestic supply, these following solutions should be implemented:

- Paying attention to science and technology. To consider science and technology as a development strategy of the country. To attach special importance to applied research.
- To take interest in education and training, especially in training people to be good specialists and skilled workers.
- To have policies to support and encourage enterprises in applying new technology into production activities, thus increasing productivity and also product quality, and consequently the competitiveness of domestic businesses.

Additionally, to keep implementing the open-door policy, further integrating into international economic environment are an integral condition to expand outside market for goods of strong points in Vietnam.

II. Limitations and recommendations for further studies

Because there exist very few aggregated economic sectors (only 16 sectors aggregated from 111 ones), each aggregated economic sectors contains various small sectors, whose nature and development are far different, the research is unspecific and therefore difficult to apply in Vietname's practical conditions. This leaves much room for improvement. On the other hand, the data for analysis are of four Input-Output tables in competitive price. The data in non-competitive price is not yet used and compared, thus outside impacts on the economy has not been analyzed yet. Thirdly, that the shift in industrial structure is labour-intensive one or capital-intensive one is not put under consideration yet. Also cost structure is left open. Moreover, the thesis concerns Vietnam alone without considering other countries.

Therefore, it can be more practical and useful if the amount of sectors aggregated is larger. Data in competitive and non-competitive price should be used for analysis and comparison. Furthermore, adding the structural shift in the direction of labour-intensive or capital-intensive and the cost structure up to the paper will make it more attractive. Analyzing Vietnam together with its neighbour countries similar to Vietnam in terms of natural conditions and economic history is a good method to make comparison, and then conclusion, therefore, can be made.

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APPENDIX: TABLES

Table A1: Annual economic growth rate of Vietnam: 1986-2005 (%)

Year	Annual GDP Growth rate(%)
1986	2.8
1987	3.6
1988	6.0
1989	4.7
1990	5.1
1991	5.8
1992	8.7
1993	8.1
1994	8.8
1995	9.5
1996	9.3
1997	8.2
1998	5.8
1999	4.8
2000	6.8
2001	6.9
2002	7.1
2003	7.3
2004	7.8
2005	8.4

Sources: Tho *et al* (2000) and GSO (2008a)

Table A2: Rice export of Vietnam: 1986-2005

Year	Rice (thousand tons)
1986	124.7
1987	120.4
1988	91.2
1989	1420.2
1990	1624.4
1991	1033.0
1992	1946.0
1993	1722.0
1994	1983.0
1995	1988.0
1996	3003.0
1997	3575.0
1998	3730.0
1999	4508.3
2000	3476.7
2001	3720.7
2002	3236.2
2003	3810.0
2004	4063.1
2005	5254.8

Sources: Tho *et al* (2000) and GSO (2008c)

Table A3: Foreign direct investment licensed in period 1991-2005

Year	Implementation capital (Mill. USD)
1991	328.8
1992	574.9
1993	1017.5
1994	2040.6
1995	2556.0
1996	2714.0
1997	3115.0
1998	2367.4
1999	2334.9
2000	2413.5
2001	2450.5
2002	2591.0
2003	2650.0
2004	2852.5
2005	3308.8

Sources: GSO (2008d)

Table A4: GDP Structure

Year	Agriculture, forestry and fishery	Industry and construction	Service
1990	31.8	25.2	43.0
1991	30.7	25.6	43.6
1992	30.2	26.6	43.2
1993	28.9	27.7	43.4
1994	27.4	28.9	43.7
1995	26.2	29.9	43.8
1996	25.1	31.3	43.6
1997	24.2	32.6	43.2
1998	23.7	33.4	42.9
1999	23.8	34.4	41.9
2000	23.3	35.4	41.3
2001	22.4	36.6	41.0
2002	21.8	37.4	40.8
2003	21.1	38.5	40.5
2004	20.4	39.4	40.3
2005	19.6	40.2	40.3

Sources: GSO (2008e) (Calculated by the author)

Table A5: Consumer price index in Vietnam: 1986-2005 (%)

(Previous December=100)

Year	Consumer price index (%)
1986	874.7
1987	323.1
1988	449.4
1989	136
1990	167.1
1991	167.5
1992	117.5
1993	105.2
1994	114.4
1995	112.7
1996	104.5
1997	103.6
1998	109.2
1999	100.1
2000	99.4
2001	100.8
2002	104
2003	103
2004	109.5
2005	108.4

Sources: Tho *et al* (2000) and GSO (2008b)

Table A6: The shares of sectoral exports to total export value in the whole economy (%)

Code	Sector	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	23.9	14.1	7.6	4.9
2	Fishery	0.0	2.8	1.9	0.9
3	Forestry	6.2	0.1	0.3	0.1
4	Mining and quarrying	11.8	12.2	21.2	21.6
5	Food, beverage & tobacco manufactures	11.0	19.1	13.7	11.6
6	Other consumer goods	23.3	21.9	22.7	30.8
7	Industrial materials	4.0	2.4	1.8	7.5
8	Capital goods	1.8	2.1	6.4	7.9
9	Electricity, gas & water	0.0	0.0	0.0	0.0
10	Construction	1.3	0.0	0.0	0.0
11	Wholesale and retail trade	8.4	6.2	9.4	5.3
12	Transport services	2.7	7.4	3.7	0.4
13	Post and telecommunication	0.6	0.9	1.0	0.7
14	Finance, insurance & real estate & business services	0.1	3.2	2.2	1.0
15	Other private services	4.8	6.5	7.1	3.7
16	Government services	0.1	1.1	1.0	3.7

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A7: The shares of sectoral imports to total import value in the whole economy (%)

Code	Sector	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	1.7	7.6	1.0	2.4
2	Fishery	0.0	0.0	0.0	0.2
3	Forestry	0.1	0.4	0.4	0.0
4	Mining and quarrying	0.6	0.3	0.8	1.6
5	Food, beverage & tobacco manufactures	5.6	4.8	3.3	4.2
6	Other consumer goods	15.9	13.7	17.4	20.7
7	Industrial materials	33.4	34.8	30.3	43.2
8	Capital goods	42.4	27.4	23.8	19.2
9	Electricity, gas & water	0.0	0.1	0.2	0.0
10	Construction	0.0	0.0	0.0	0.0
11	Wholesale and retail trade	0.0	0.0	12.6	0.0
12	Transport services	0.0	3.7	2.5	1.1
13	Post and telecommunication	0.1	0.4	0.1	0.8
14	Finance, insurance & real estate & business services	0.1	2.6	2.8	2.0
15	Other private services	0.0	3.4	2.2	1.9
16	Government services	0.0	0.8	2.5	2.7

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A8: The ratio of sectoral exports to their total demand (%)

Code	Sector	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	12.1	13.9	14.1	13.5
2	Fishery	0.3	16.8	18.3	6.8
3	Forestry	27.9	1.6	7.1	3.1
4	Mining and quarrying	68.5	58.2	82.9	82.6
5	Food, beverage & tobacco manufactures	16.0	23.9	24.7	24.8
6	Other consumer goods	27.3	30.1	33.5	37.4
7	Industrial materials	4.5	3.3	2.9	9.3
8	Capital goods	1.6	4.4	14.3	18.2
9	Electricity, gas & water	0.0	0.0	0.0	0.0
10	Construction	2.9	0.0	0.0	0.0
11	Wholesale and retail trade	16.7	20.0	20.7	26.9
12	Transport services	11.2	31.1	37.2	6.5
13	Post and telecommunication	28.8	21.2	20.8	11.5
14	Finance, insurance & real estate & business services	1.1	27.2	22.8	5.8
15	Other private services	7.5	14.7	21.7	20.0
16	Government services	0.1	3.1	3.5	15.1
	The whole economy	11.5	15.9	20.1	21.3

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A9: The ratio of sectoral imports to their total supply (%)

Code	Sector	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	1.5	9.5	2.1	7.7
2	Fishery	0.0	0.1	0.3	2.1
3	Forestry	0.9	8.6	11.2	1.8
4	Mining and quarrying	6.2	1.9	3.6	7.2
5	Food, beverage & tobacco manufactures	14.6	7.6	6.7	10.5
6	Other consumer goods	33.2	23.9	28.7	29.5
7	Industrial materials	66.4	61.5	55.0	62.5
8	Capital goods	68.9	73.8	59.7	51.5
9	Electricity, gas & water	0.0	0.8	2.8	0.6
10	Construction	0.0	0.0	0.0	0.0
11	Wholesale and retail trade	0.0	0.0	31.0	0.0
12	Transport services	0.0	19.9	28.6	18.3
13	Post and telecommunication	6.2	12.5	2.9	13.5
14	Finance, insurance & real estate & business services	2.2	28.2	32.6	13.6
15	Other private services	0.0	9.7	7.4	12.1
16	Government services	0.0	2.9	10.6	13.1
	The whole economy	20.4	20.2	22.6	24.9

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A10: The sectoral production share (%)

Code	Sector	1989	1996	2000	2005
1	Agricultural crops, livestock & poultry : agricultural services	28.1	18.1	13.7	9.5
2	Fishery	1.3	3.3	2.8	3.6
3	Forestry	3.2	1.1	0.8	0.7
4	Mining and quarrying	2.3	4.1	6.4	6.9
5	Food, beverage & tobacco manufactures	8.4	14.7	13.4	11.9
6	Other consumer goods	8.2	11.0	12.6	16.5
7	Industrial materials	4.3	5.5	7.2	8.6
8	Capital goods	4.9	2.5	4.7	6.0
9	Electricity, gas & water	2.2	2.6	2.1	1.9
10	Construction	6.4	9.6	9.3	10.9
11	Wholesale and retail trade	7.2	6.2	8.1	5.6
12	Transport services	3.5	3.8	1.8	1.6
13	Post and telecommunication	0.3	0.7	1.2	1.6
14	Finance, insurance & real estate & business services	1.7	1.7	1.7	4.2
15	Other private services	9.1	7.9	7.8	4.6
16	Government services	8.7	7.1	6.3	6.0

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A11: Annual averaged gross output growth (%)

Code	Sector	1989-1996	1996-2000	2000-2005
1	Agricultural crops, livestock & poultry : agricultural services	8.1	5.4	3.0
2	Fishery	31.6	7.8	16.9
3	Forestry	-1.0	4.8	6.9
4	Mining and quarrying	24.8	26.3	12.4
5	Food, beverage & tobacco manufactures	24.6	10.4	8.1
6	Other consumer goods	20.0	16.9	16.9
7	Industrial materials	19.0	20.9	14.7
8	Capital goods	4.3	32.8	16.3
9	Electricity, gas & water	18.2	6.2	8.6
10	Construction	22.0	12.2	14.3
11	Wholesale and retail trade	12.5	21.1	2.8
12	Transport services	16.5	-5.7	7.2
13	Post and telecommunication	33.2	27.0	17.9
14	Finance, insurance & real estate & business services	15.0	13.7	32.6
15	Other private services	12.8	12.7	-0.5
16	Government services	11.9	9.4	9.7
	The whole economy	15.1	13.0	10.8

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A12: Annual averaged export growth (%)

Code	Sector	1989-1996	1996-2000	2000-2005
1	Agricultural crops, livestock & poultry : agricultural services	11.7	3.7	3.3
2	Fishery	130.8	10.2	-3.8
3	Forestry	-33.6	54.1	-11.5
4	Mining and quarrying	21.1	38.6	13.1
5	Food, beverage & tobacco manufactures	30.5	11.1	9.1
6	Other consumer goods	19.5	22.0	19.8
7	Industrial materials	12.0	12.7	49.7
8	Capital goods	23.3	59.7	17.6
9	Electricity, gas & water	-	-	-
10	Construction	-	-	-
11	Wholesale and retail trade	15.5	34.1	0.5
12	Transport services	39.0	1.6	-26.4
13	Post and telecommunication	28.8	23.1	7.2
14	Finance, insurance & real estate & business services	91.3	10.4	-4.2
15	Other private services	25.9	23.5	-1.2
16	Government services	80.1	15.4	47.5
	The whole economy	20.5	20.8	12.7

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A13: Annual averaged import growth (%)

Code	Sector	1989-1996	1996-2000	2000-2005
1	Agricultural crops, livestock & poultry : agricultural services	42.0	-29.3	35.1
2	Fishery	-	46.8	76.4
3	Forestry	39.4	12.6	-27.2
4	Mining and quarrying	4.3	49.6	30.1
5	Food, beverage & tobacco manufactures	12.2	6.8	19.1
6	Other consumer goods	12.4	24.3	17.8
7	Industrial materials	15.5	13.1	22.1
8	Capital goods	7.9	13.0	8.8
9	Electricity, gas & water	-	48.1	-21.8
10	Construction	-	-	-
11	Wholesale and retail trade	-	-	-
12	Transport services	-	6.2	-4.6
13	Post and telecommunication	48.7	-14.3	64.6
14	Finance, insurance & real estate & business services	73.0	19.7	5.8
15	Other private services	-	4.6	10.9
16	Government services	-	54.5	15.2
	The whole economy	14.9	17.1	13.7

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)

Table A14: Annual output change per year (thousand VND)

Code	Sector	1989-1996	1996-2000	2000-2005
1	Agricultural crops, livestock & poultry : agricultural services	6204895	6047105	3987403
2	Fishery	2307485	1665934	6054121
3	Forestry	-63956	324725	604855
4	Mining and quarrying	2625725	9002504	9411304
5	Food, beverage & tobacco manufactures	9402346	10155196	11865915
6	Other consumer goods	6441336	13522295	27566179
7	Industrial materials	3149008	8911767	13159380
8	Capital goods	505616	7373719	9841557
9	Electricity, gas & water	1473416	1017027	1937731
10	Construction	5863989	7962757	16408746
11	Wholesale and retail trade	2810496	10101427	2238039
12	Transport services	2027745	-1130227	1423670
13	Post and telecommunication	513773	1664099	2761588
14	Finance, insurance & real estate & business services	845802	1586864	9820189
15	Other private services	3670697	6908624	-378229
16	Government services	3153426	4389480	6808141
	The whole economy	50931801	89503295	123510591

Sources: Calculated from Input-Output tables of 1989, 1996, 2000, 2005 (GSO and MOF)