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# Growth and inducement effects of export-led processing industries in the global production chain

## The case of Viet Nam

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# Growth and inducement effects of export-led processing industries in the global production chain

## The case of Viet Nam

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## Abstract

This paper examines the structures of the export-oriented industries in Viet Nam in order to assess the industries' contribution to the economy in terms of not only their own value added and employment growth but also through backward linkages with other industries. The input-output analysis indicates that the garment and footwear industries had limited direct and indirect linkages with the rest of the economy and did not improve the shallow industrial structure during the period of rapid export growth. Market liberalization revealed the country's comparative advantage in labour-intensive industries and brought about some improvement in productivity, but the industries did not play a catalytic role in deepening industrialization, as observed in the experiences of some earlier developing countries.

## Introduction

For developing countries that have recently succeeded in setting off industrialization, this was often possible through participation of labour-intensive industries in global value chains. Recent studies show that despite limited human, institutional and infrastructural development, this industrialization path provided them with opportunities of value added growth, foreign exchange earnings, employment generation and poverty alleviation (Collier, 2007; Kabeer, 2004; Thoburn, 2007; Jenkins, 2004; Fukunishi, 2006).

In addition to direct contributions, in earlier industrialized countries, labour-intensive industries often played a catalytic role in expanding the industrial base through forward and backward linkages, and laying a foundation for further technological upgrading. Given the limited resources of developing countries, Hirschman (1958) favoured unbalanced growth, that is, investment priority should be given to industries with significant potential for creating backward linkages. Therefore, he advocated the establishment of "last" industries first to perform final-touch processing on products before selling them to consumers. It was expected that initially intermediate inputs would be mostly imported because of the limited domestic capacities to produce such inputs. However, he argued that as the last stage industries expand, demand for intermediate inputs increase, and when such demand crosses the "threshold" of minimum economic size, capital formation of the intermediate sectors will be triggered.

Both developed countries as well as newly industrializing countries (NICs) were successful in creating substantial backward linkages for their labour-intensive final manufactures, such as food processing, leather products, apparel and wood products (Hirschman, 1958 and Yotopoulos, 1973). Evidence shows that in some recent emerging economies, such as Thailand and Turkey, the participation of local suppliers in garment production has also been sufficiently high (Neidik, 2004). This paper examines whether Viet Nam has been following the successful path of earlier developing countries, and infers the prospect of developing backward linkages with upstream sectors once a foothold in the final processing stage of labour-intensive industries is secured. After carefully isolating country-specific factors, it is hoped that

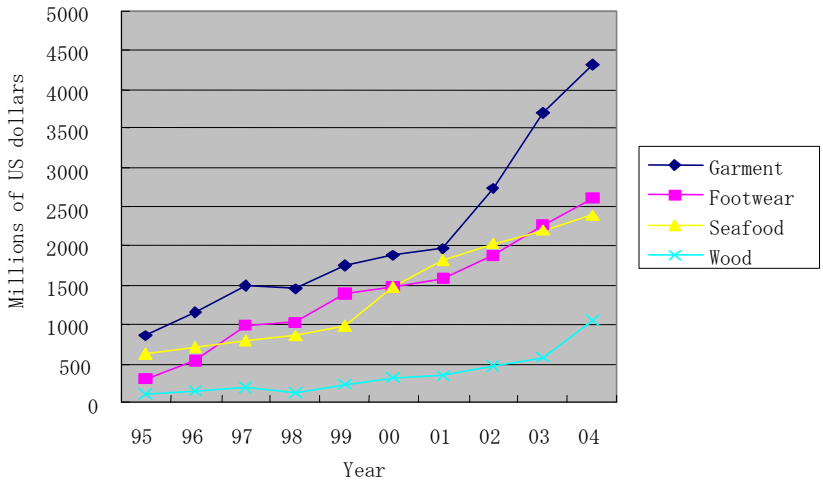
this case study on Viet Nam, will provide lessons for African and other Asian countries following a similar industrialization path, namely, engaging in labour-intensive tasks in international production network by leveraging their cheap labour costs and preferential trade arrangements with developed countries.

**Background**

Moving towards a market-oriented economy through *doi moi*, the Vietnamese economy has grown rapidly especially since 1992 with over 8 per cent GDP growth until the Asian financial crisis of 1997, and an average of around 6.7 per cent since then. Except for a few years, both industrial output and exports have registered double-digit growth since 1992, and the declining trend of FDI flow since the crisis has been reversed recently, reaching 41 per cent growth in 2004. This rapid economic growth has been realized through industrialization and integration into the world economy, which was possible due to the increasing foreign investment and assistance. Among the sources of final demand, exports have been the major contributor to this growth spurt. Between 1995 and 2000, it has been estimated that two thirds of the GDP growth arose from export growth (Weeks et al., 2004). The average annual export growth of 15.8 per cent since then, though slightly lower than the previous five years, has not substantially changed the picture of export contribution to the economy.

The garment, footwear, seafood processing and wood processing industries are four of the only five sectors in Viet Nam, excluding crude oil, which exported more than US$1 billion in 2004. As shown in figure 1, exports of especially garments, footwear and seafood have grown rapidly past ten years, registering average annual growth rates of 19.77 per cent, 27.31 per cent and 16.21 per cent, respectively, while exports of wood products have taken off only recently, resulting in the annual growth of 27.86 per cent during the same period.

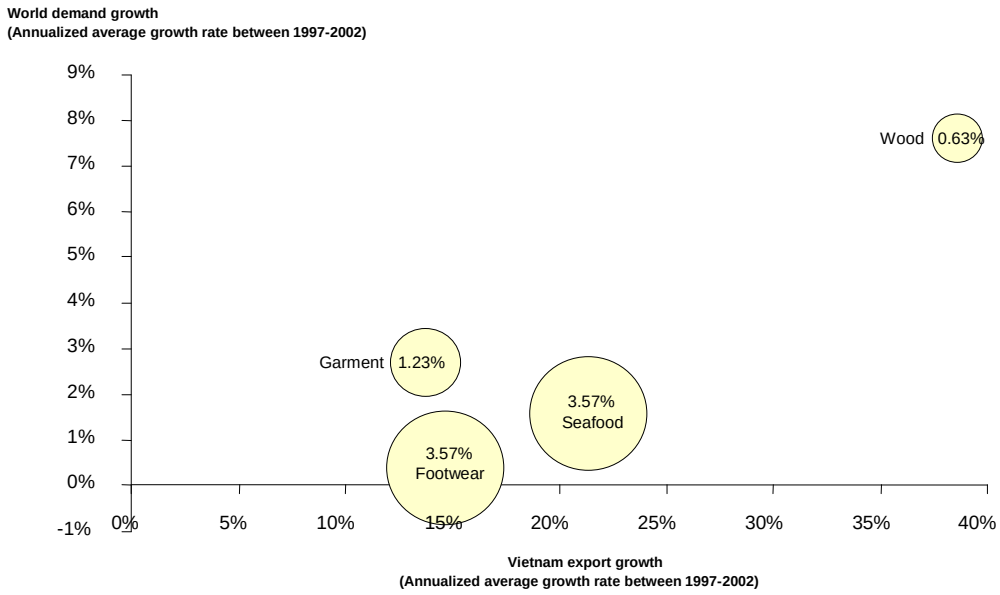
**Figure 1. Export growth, 1995-2004**




*Source:* GSO statistical yearbook, various years.

Figure 2 illustrates that the remarkable growth in these sectors has been realized during the period of moderate growth in world imports for these products. The sizes of and percentages in the bubbles indicate Vietnam's export share in world imports in 2002.[1]

**Figure 2. Vietnamese export growth in the world imports**




*Source*: UNIDO based on UN COMTRADE.

[1] The main reasons for using the period from 1997 to 2002 here is because of lack of Vietnamese export data for other years in UN commodity trade statistics database (UN COMTRADE), and to avoid mixing it with other local data sources, since the classifications of the Vietnamese official trade data are different from SITC.

The above two figures show that Viet Nam succeeded in making good use of its advantages in agro-based and light manufacturing industries because of its relatively cheap materials and labour, thus helping to vigorously exploit untapped world markets, as the country increased its participation in the global economy in the 1990s.

Exports as a whole and the four major exporting sectors in particular have made significant contributions to economic growth. Between 1995 and 2003, GDP grew at an annual rate of 7 per cent. While the final demand of private consumption, Government consumption, and investment in GDP grew at 5.56, 3.94 and 10.69 per cent, respectively, exports soared at a pace of 18.47 per cent, accounting for the 58 per cent GDP growth in 2004.[1] In 2003, excluding crude oil, the share of the four major exports in total exports was 53.32 per cent, suggesting their considerable contribution to economic growth. Along with the export increase, the major exporting sector experienced commensurate output growth during the same period, as shown in table 1.[2]

**Table 1. Output growth of the three sectors at constant 1994 prices (Billion Vietnamese dong)**

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | AAGR* |
|---|---|---|---|---|---|---|---|---|---|
| Garments | 8,622 | 12,942 | 17,675 | 20,997 | 20,549 | 26,894 | 30,449 | 38,545 | 23.85% |
| Footwear and leather products | 3,570 | 4,469 | 6,614 | 7,083 | 7,725 | 8,851 | 9,529 | 11,096 | 17.59% |
| Processed wood products | 3,324 | 3,199 | 3,146 | 2,956 | 3,180 | 3,598 | 3,903 | 4,488 | 4.38% |

*Annual Average Growth Rate.
*Source*: GSO statistical yearbook, various years.

The above discussion underscores that exports have been the driving force of economic growth and that the four sectors have been particularly instrumental in the growth of exports and hence of the economy.

Table 2 shows the employment figures for the garment (and textile), leather/footwear and wood processing sectors.[3]

1 While imports also grew rapidly at 14.77 per cent during the period, it would not be appropriate to combine imports and exports as a single term since we need to consider the contribution of supply side for growth analysis, and imports results from all categories of final demand, not exports alone (Week et al., 2004).

2 There is no disaggregated output data available for the seafood sector within the total of the food sector in the GSO statistics.

3 Employment data for the seafood sector are not available since the data for the food sector is not disaggregated in the GSO statistics.

**Table 2. Employment in the three exporting sectors**

| Sector | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | AAGR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Garments | 268,626 | 282,783 | 285,149 | 285,586 | 315,765 | 350,604 | 387,233 | 511,170 | 596,162 | 650,027 | 10.32% |
| Textiles | 256,220 | 247,493 | 219,846 | 200,799 | 219,477 | 244,570 | 257,005 | 276,833 | 286,752 | 291,900 | 1.46% |
| **Textiles and garments total** | **524,846** | **530,276** | **504,995** | **486,385** | **535,242** | **595,174** | **644,238** | **788,003** | **882,914** | **941,927** | **6.71%** |
| Footwear and leather products | 101,871 | 137,326 | 181,631 | 206,563 | 249,660 | 312,974 | 343,199 | 409,873 | 484,275 | 528,343 | 20.07% |
| Processed wood products | 339,415 | 341,368 | 307,469 | 318,836 | 315,400 | 327,035 | 348,400 | 421,057 | 451,979 | 465,717 | 3.58% |

*Source*: GSO (2000) and GSO statistical yearbook 2003, *Vietnamese industry in 20 years of renovation and development* on GSO website.

Compared with the growth of exports and output, except for the footwear and leather sectors, it is clear that employment in these sectors grew at a much lower rate. The garment and processed wood sectors experienced a slow or negative growth in employment during the period of Asian financial crisis. It is also interesting to note that, while employment in the garment sector grew at 10.32 per cent annually on average, employment in the textile sector, the major supplier to the garment sector, increased very slowly. This seems to indicate that the expansion of garment production depended largely on either an increase in imported materials or productivity increase in the textile sector, or both. Table 3 shows the decomposition of employment growth based on the Chenery method, and illustrates the sources of employment changes. The result confirms that both import penetration and productivity increase were the causes of the slow growth of employment in the textile sector. Between the two, the effect of import penetration had a far greater impact on restraining the employment expansion of the sector. In the case of the garment sector, productivity change had not worked against the employment growth. Contrary to the findings of some studies ( Nadvi, 2004; Jenkins, 2004), these results indicate that the productivity increase may not have been the prime cause of preventing the textile and garment sector from absorbing more workers.

**Table 3. Decomposition of employment growth, 1997-2002**

| Sector | Domestic demand | Export growth | Import penetration | Productivity change | Total employment |
|---|---|---|---|---|---|
| Textiles | 168,108 | 102,715 | -207,061 | -6,775 | 56,987 |
| Garments | -43,271 | 255,288 | -31,943 | 21,400 | 201,473 |
| Processed woods | 8,814 | 13,878 | 3,307 | 78,533 | 104,532 |

*Note*: The calculations are based on the Chenery method used by Jenkins (Jenkins, 2004). The period between 1997 and 2002 was chosen due to the availability of trade data. Also considering data limitations and data compatibility between trade and production data, only three sectors are included in the analysis.

*Source*: Own calculations based on the data obtained from UN COMTRADE database (SITC 2); GSO statistical yearbook, various years; *Vietnamese industry in 20 years of renovation and development* on GSO website.

In fact, as shown in table 4, although the total value added increased between 1997 and 2000, the two years for which data are available from the social accounting matrix, labour value added did not increase. This seems to point out that, if there was any productivity increase, it was mainly due to capital investment, not to the skill improvement of the labour force. The direct and indirect effects of import penetration and capital investment on value added are further clarified, based on input-output analyses below.

**Table 4: Value added in 1997 and 2000 (Billion Vietnamese dong)**

| Sector | 1997 | | 2000 | |
|---|---|---|---|---|
| | Total value added | Labour value added | Total value added | Labour value added |
| Garments | 2,705 | 2,014 | 3,783 | 1,549 |
| Footwear and leather products | 2,623 | 2,088 | 3,991 | 1,965 |
| Processed seafood | 3,032 | 2,380 | 3,202 | 1,334 |
| Processed wood products | 2,210 | 1,530 | 2,267 | 914 |

*Source*: 1997 and 2000 Social Accounting Matrix.

**Linkage analysis**

The results of this section are based on input-output calculations (appendix 1) using the two available Vietnam Social Accounting Matrices (SAM) for 1997 and 2000. Table 5 shows that the share of imports, or value added in foreign countries, increased dramatically for all sectors, with the exception of processed wood. As a result, between 1997 and 2000 the contribution of domestic factors to value added substantially decreased in the seafood, garment and footwear sectors, especially for the latter two. For example, in 1997, the production of US$100 worth of garments and footwear would have increased domestic value added by US$51 and US$56, respectively, but in 2000 the same production would have increased the value added only by US$29 for the garment and US$33 for the footwear sectors, and, for both sectors, more than US$60 would have come from import.

**Table 5. Shares in the total value added for producing one unit, 1997 and 2000**

| Sector | Processed seafood and by products | | Processed wood and wood products | | Ready-made clothes, sheets | | Leather and footwear | |
|---|---|---|---|---|---|---|---|---|
| **Year** | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 |
| Import | 0.1804 | 0.2941 | 0.3078 | 0.2643 | 0.4622 | 0.6622 | 0.4100 | 0.6251 |
| Domestic value added | 0.7845 | 0.6415 | 0.6422 | 0.6330 | 0.5121 | 0.2919 | 0.5607 | 0.3291 |
| Tax | 0.0334 | 0.0644 | 0.0466 | 0.1027 | 0.0229 | 0.0458 | 0.0276 | 0.0458 |

*Source*: Own calculations based on Vietnam Social Accounting Matrix 1997 and 2000.

This result indicates that the garment, footwear and, to a lesser extent, processed seafood sectors became significantly more import dependent in 2000, which reduced the share of domestic value added. Indeed, among 112 sectors listed in the SAM for the year 2000, the share of the domestic value added for the garment sector was ranked the second lowest, one hundred and twelfth, and that of the footwear sector was one hundred and sixth.

Jenkins (2004) estimated the ratio of imported materials and supplies to sales, presumably only taking account of direct inputs to respective sectors. Based on his calculations, in 1999 the ratios for leather and footwear, and clothing were 57.3 and 48.1 per cent, respectively. In contrast, even though the results are for 2000, the above input-output analysis, which includes inputs imported by the supply sectors as a

result of production in the two sectors, shows a much higher import dependency; they are 62.5 per cent for leather and footwear, and 66.2 per cent for clothing. These dependency rates had increased significantly as their exports expanded between 1997 and 2000. Appendix 2 shows the supply bottlenecks for the footwear and leather, garment, processed seafood and processed wood sectors. It shows how much one unit of the sector's production would have induced outputs from their major supply sectors. The first column exhibits total induced amount of the supply sector as a result of one unit of production, regardless of output origins, domestic or foreign suppliers. Out of the total output induced, amounts induced among domestic suppliers are shown in the second column. The third column, the second column divided by the first, indicates the domestic supply rates. From the tables, first, it is clear that the footwear and garment sectors had low linkages with their key material suppliers, such as the textile and leather sectors, and the situation did not improve much between 1997 and 2000. Second, for all four sectors, non-ferrous metals, gasoline and plastic were important supporting sectors but could be hardly procured domestically. Finally, except for processed wood, one unit of production would have induced more outputs in their supply sectors in 2000 than in 1997; however, domestic inputs failed to take advantage of these expanded opportunities, and induced demand mostly spread to foreign suppliers. These results suggest that, as their exports grew, these sectors probably started demanding a higher level of quality and quantity of inputs than the domestic suppliers could satisfy.

*Domestic factor inputs*

The growth of major export sectors intensified their dependence on imports for their key materials and supporting inputs, and hence the share of domestic value added in total decreased significantly. Thus growth did not benefit the domestic economy as much. This section also looks at domestic value added and determines which production factor's share had been reduced most in the sharp decline of domestic value added share.

**Table 6A. Domestic value added by production factors, 1997**

| Type | Processed seafood and by products | | Processed wood and wood products | | Ready-made clothes, sheets | | Leather and footwear | |
|---|---|---|---|---|---|---|---|---|
| | Value added | Percentage | Value added | Percentage | Value added | Percentage | Value added | Percentage |
| Domestic value added | 0.7845 | 100 | 0.6422 | 100 | 0.5121 | 100 | 0.5607 | 100 |
| Land | 0.0847 | 10.80 | 0.1300 | 20.24 | 0.0097 | 1.90 | 0.0039 | 0.69 |
| Capital | 0.1504 | 19.18 | 0.1656 | 25.78 | 0.1739 | 33.95 | 0.1486 | 26.51 |
| Labour total | 0.5494 | 70.02 | 0.3467 | 53.98 | 0.3285 | 64.14 | 0.4082 | 72.81 |
| Non-skilled labour | 0.4749 | 60.53 | 0.2748 | 42.79 | 0.2414 | 47.14 | 0.2863 | 51.06 |
| Mid-skilled labour | 0.0678 | 8.64 | 0.0645 | 10.05 | 0.0796 | 15.54 | 0.1154 | 20.59 |
| High-skilled labour | 0.0067 | 0.85 | 0.0074 | 1.14 | 0.0075 | 1.46 | 0.0065 | 1.16 |

*Note*: Non-skilled labour includes those who had no formal education or primary education only. Mid-skilled labour includes those who had high school or vocation education, but no tertiary education. High-skilled labour are people with tertiary education or higher.
*Source*: Own calculations, with data drawn from Vietnam Social Accounting Matrix 1997 and 2000.

**Table 6B. Domestic value added by production factors, 2000**

| Type | Processed seafood and by products | | Processed wood and wood products | | Ready-made clothes, sheets | | Leather and footwear | |
|---|---|---|---|---|---|---|---|---|
| | Value added | Percentage | Value added | Percentage | Value added | Percentage | Value added | Percentage |
| Domestic value added | 0.6415 | 100 | 0.6330 | 100 | 0.2919 | 100 | 0.3291 | 100 |
| Land | 0.0162 | 2.53 | 0.0357 | 5.65 | 0.0052 | 1.78 | 0.0040 | 1.22 |
| Capital | 0.2686 | 41.87 | 0.2745 | 43.36 | 0.1484 | 50.83 | 0.1505 | 45.74 |
| Labour total | 0.3567 | 55.59 | 0.3228 | 50.99 | 0.1384 | 47.38 | 0.1746 | 53.03 |
| Non-skilled labour | 0.2895 | 45.13 | 0.2595 | 40.99 | 0.0979 | 33.52 | 0.1233 | 37.46 |
| Mid-skilled labour | 0.0535 | 8.33 | 0.0497 | 7.86 | 0.0284 | 9.73 | 0.0360 | 10.92 |
| High-skilled labour | 0.0137 | 2.13 | 0.0136 | 2.14 | 0.0121 | 4.13 | 0.0153 | 4.65 |

*Note*: Non-skilled labour includes those who had no formal education or primary education only. Mid-skilled labour includes those who had high school or vocation education, but no tertiary education. High-skilled labour are people with tertiary education or higher.
*Source*: Own calculations, with data drawn from Vietnam Social Accounting Matrix 1997 and 2000.

A comparison of tables 6A and 6B clearly shows that, amid dwindling domestic value added, the contribution of labour decreased most, in absolute terms, as well as the share in value added. Astonishingly, for the garment and leather/footwear sectors, the shares of labour value added in the total were halved during the three years, while those of land and capital were largely maintained. As a result, the production structure shifted to become relatively more capital intensive. The decomposition of labour into three levels of skill categories indicate that among the three the contribution of non-skilled labour dropped considerably. This change in production structure was likely to have limited the benefits of growth to the poor, as non-skilled workers tended to be poorer than higher skilled-workers (Vietnam Household Living Standards Survey, 2002). The only labour category for which the contribution of value added increased was in high-skilled labour. During the process of the shift to a more capital-intensive production structure, probably the demand for higher skilled managers, who monitor the production system, increased slightly.

A more detailed labour classification is available only for the SAM 2000. Looking at the non-skilled labour category alone, which decreased but is still the biggest contributor to value added among the labour categories, table 7 shows clearly that the rural labour force contributed to the major export sectors more than the urban labour force, especially for the processed seafood and wood sectors. Moreover, for all the four sectors the contribution of male non-skilled labour to value added was greater than that of female non-skilled labour. This may appear contrary to conventional belief, since especially the garment and footwear sectors employ a relatively large number, up to 80 per cent, of female workers. There may be two reasons why the valued added of male workers was higher than that of female workers. First, even though the number of female workers was larger than that of male workers, male workers as a whole might have received higher remunerations than female workers due to differences in their duties or lengths of experience. Second, this analysis takes into account the value added not only of the four sectors but of all sectors, which directly or indirectly adds value during the process of producing a final product in the four sectors. Thus, despite the fact that the garment and footwear sectors in Viet Nam are known to employ a large number of female workers, male workers might have made substantial contributions to the value added in the upstream activities of the production chains.

**Table 7. Value added of non-skilled labour by location and gender, 2000**

| | Processed seafood and by products | | Processed wood and wood products | | Ready-made clothes, sheets | | Leather and footwear | |
|---|---|---|---|---|---|---|---|---|
| | Value added | Percentage | Value added | Percentage | Value added | Percentage | Value added | Percentage |
| Non-skilled labour total | 0.2895 | 45.13 | 0.2595 | 40.99 | 0.0979 | 33.52 | 0.1233 | 37.46 |
| Rural male non-skilled | 0.1386 | 21.61 | 0.1211 | 19.13 | 0.0290 | 9.93 | 0.0363 | 11.02 |
| Rural female non-skilled | 0.1108 | 17.28 | 0.0968 | 15.30 | 0.0232 | 7.94 | 0.0290 | 8.81 |
| Urban male non-skilled | 0.0223 | 3.47 | 0.0231 | 3.65 | 0.0254 | 8.70 | 0.0323 | 9.80 |
| Urban female non-skilled | 0.0178 | 2.77 | 0.0184 | 2.91 | 0.0203 | 6.95 | 0.0258 | 7.83 |

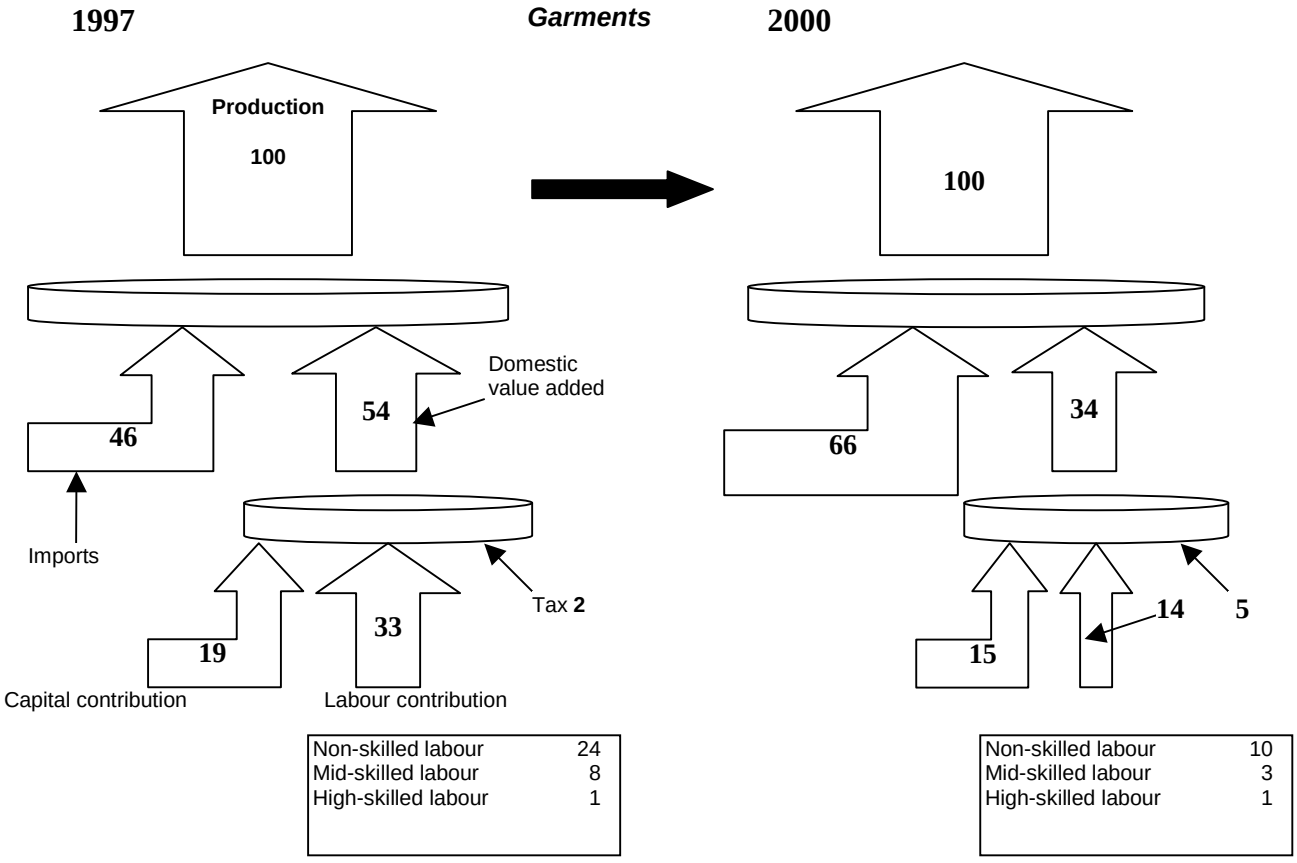
*Source*: Author's calculations, with data drawn from Viet Nam Social Accounting Matrix 2000.

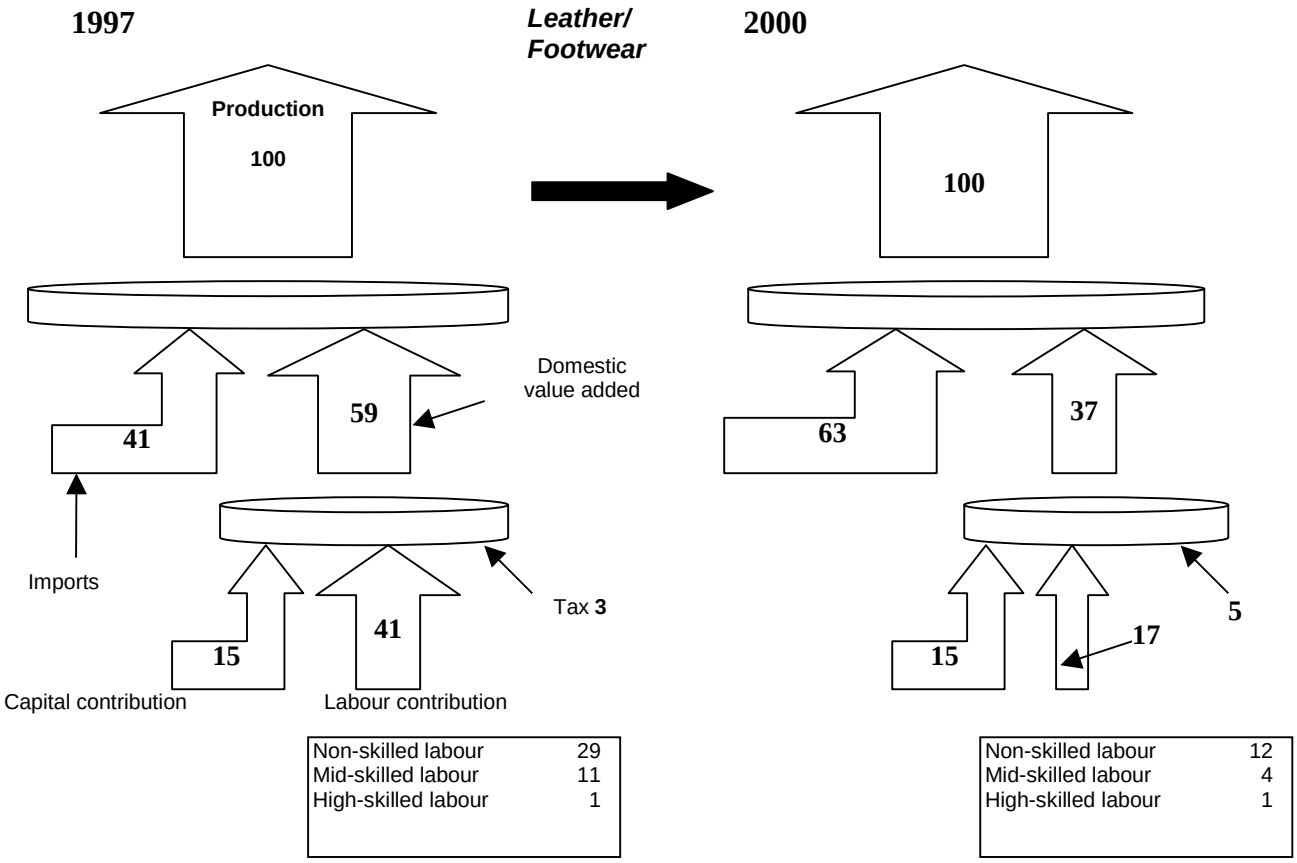
An examination of domestic value added revealed that relative decrease in labour has an impact on the production of the four export sectors, as well as on the process of their capital intensification. A closer look at the details of the labour categories, the above table shows that the contribution to production of workers, non-skilled and semi-skilled, are affected most by the decline. Finally, despite the predominance of

women among the rank and files in the garment and footwear sectors, their contribution to total value added was smaller than their male counterparts in 2000.

*Combined effects of import increase and capital intensification.* This section treats both changes in the share of imports and in the share of production factors within domestic value added, and depicts the comprehensive picture of how the production structure changed between 1997 and 2000 to see its impact on labour. The four diagrams below (figure 3) illustrate how the value of, say, US$100 worth of a final product in the sectors is added by import and domestic production factors.

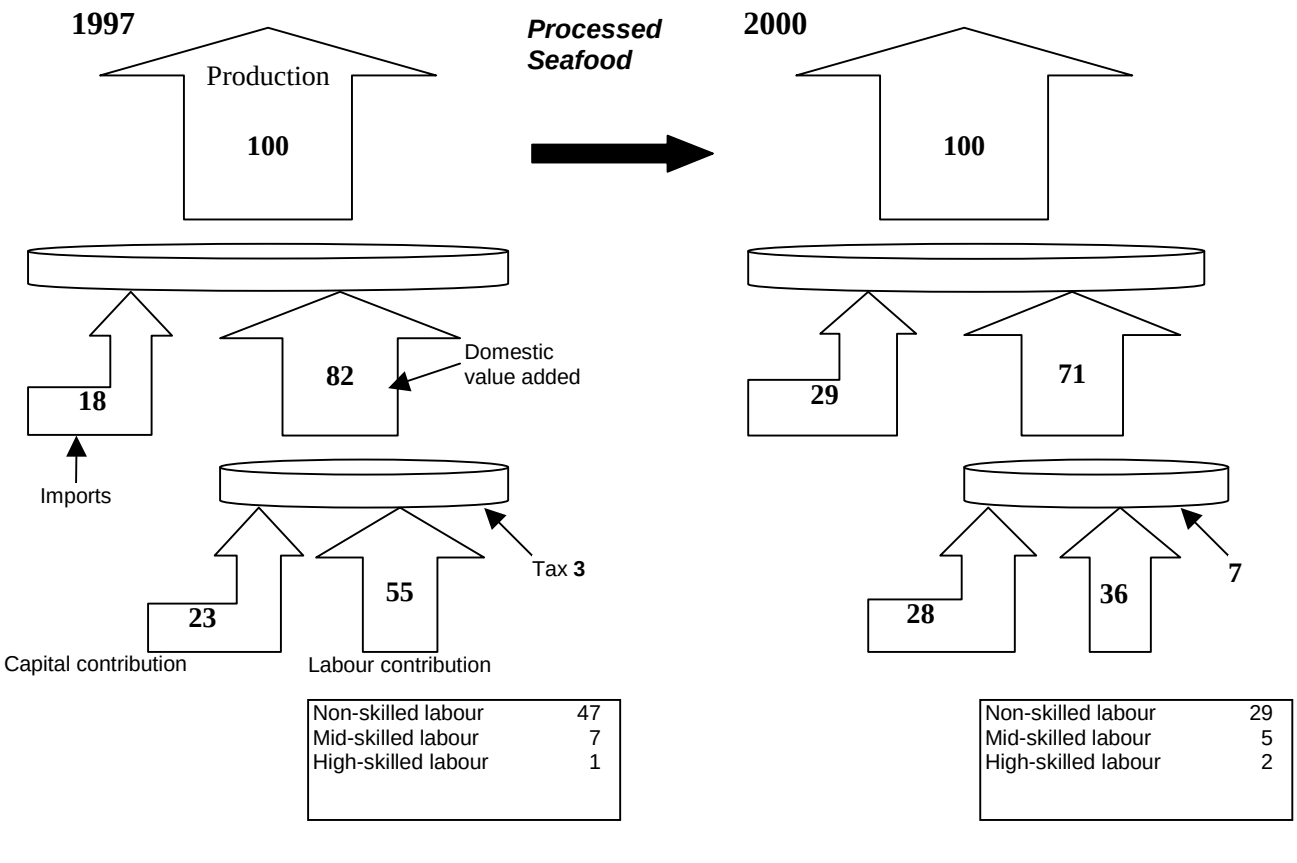
**Figure 3. Value added of final product increased through imports/domestic factors**





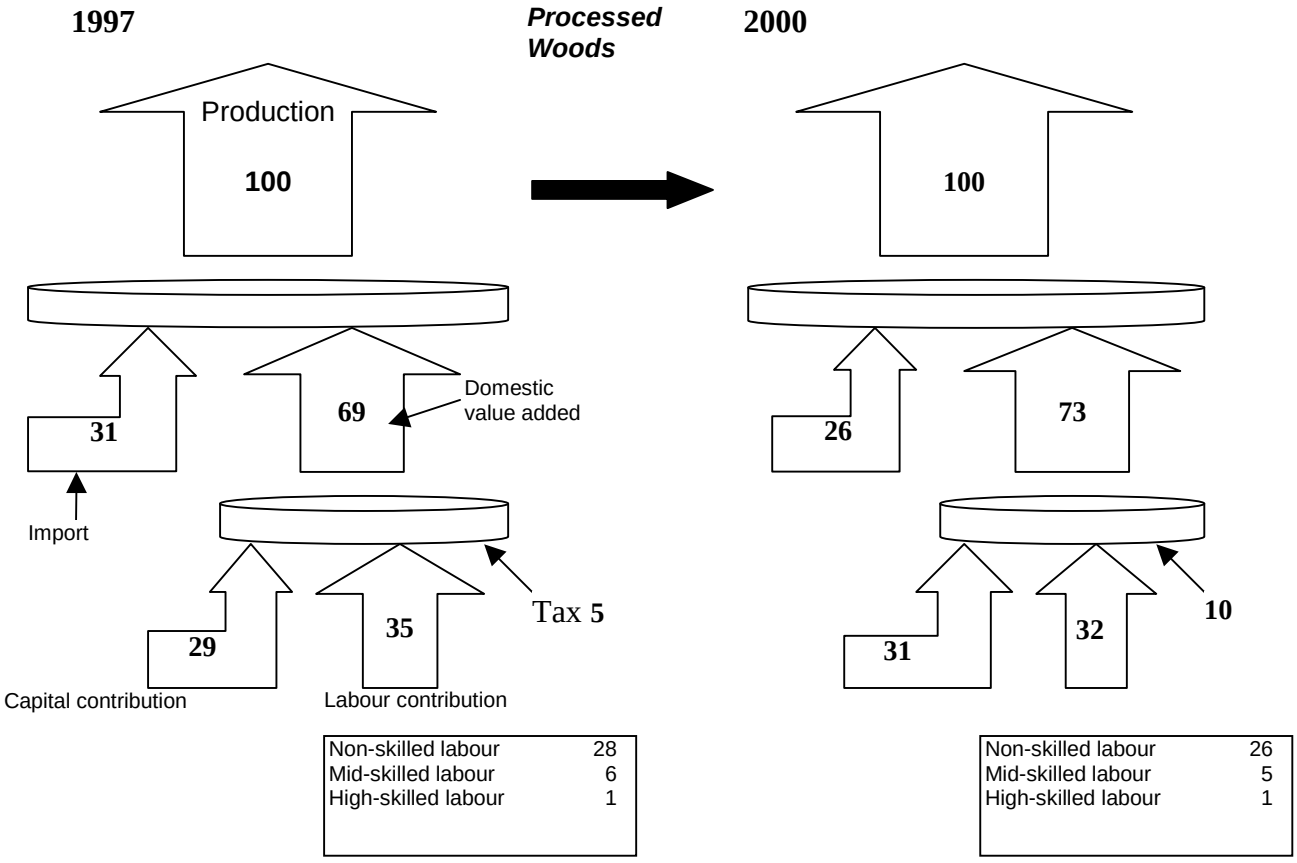

| | |
|---|---|
| Non-skilled labour | 29 |
| Mid-skilled labour | 11 |
| High-skilled labour | 1 |

| | |
|---|---|
| Non-skilled labour | 12 |
| Mid-skilled labour | 4 |
| High-skilled labour | 1 |




| | |
|---|---|
| Non-skilled labour | 47 |
| Mid-skilled labour | 7 |
| High-skilled labour | 1 |

| | |
|---|---|
| Non-skilled labour | 29 |
| Mid-skilled labour | 5 |
| High-skilled labour | 2 |




*Source*: Own calculations, with data drawn from the Vietnam Social Accounting Matrix 1997 and 2000.

Except for the processed wood sector, the combined effects of increase in imports and a shift to a relatively capital-intensive production structure sharply reduced the share of domestic labour contributions, especially of non-skilled and semi-skilled labour, to value added. This is especially the case for the garment and leather/footwear sectors where the decrease in the share of domestic value added, due to increase in the share of imports, largely resulted in the decline of the labour share in value added with no or limited decrease in the capital share. In 1997, when the garment and leather/footwear sectors produced US$100 of a final product, those employed in these sectors used to receive US$33 and US$41, respectively. But in 2000, the production of the same value in these sectors, employees received less than the half the amounts in 1997. Even the natural resource based sectors of processed seafood and processed wood reduced the labour value added because of the combinations of import increase and capital intensification for the former, and tax increase and capital intensification for the latter. Nevertheless, for these sectors, still the largest value added came from the labour. As a result, in order for the garment and leather/footwear sectors to create

the same amount of labour value added as the natural resource based sectors, the export amount of the former two had to be more than double the amount of the latter two. In case of value added of non-skilled labour, in 2000 the garment sector would have had to almost triple the export in order to create the same amount of value added as the processed seafood sector.

*Effect on household income.* Export growth seems to have induced changes in the production structure, which in turn slowed the expansion of labour participation in value-added activities. This section hints at how this effect on labour was translated into changes at household level. Since rural labour comprises more than 80 per cent of non- and semi-skilled labour contribution to the processed seafood and woods sectors and nearly 50 per cent of their contribution to the garment and footwear sectors, the significant decrease in value added of non- and semi-skilled workers for the same amount of outputs produced intuitively reflects the corresponding decline in rural household income. The more detail distribution of factor value added to the various categories of households can be measured only for the entire economy. Nevertheless, the profound influence of the four sectors on the country's income distribution is inferred, as in 2000 the mere four out of 112 sectors accounted for 12.5 per cent and 25 per cent of the outputs induced by total final demand and exports, respectively.

**Table 8. The effect of final demand increase on the domestic factor value added and on household incomes**

| 2000 | Non | Mid | High | Total |
|---|---|---|---|---|
| **RAGS** | 15.0908 | 1.6777 | 0.1549 | 16.9234 |
| **RNAS** | 4.8678 | 0.8136 | 0.0351 | 5.7165 |
| **RWAG** | 3.3228 | 0.6184 | 0.1298 | 4.0710 |
| **UAGS** | 1.7268 | 0.2024 | 0.0395 | 1.9687 |
| **UNAS** | 5.3430 | 1.8986 | 0.5779 | 7.8195 |
| **UWAG** | 4.3175 | 2.9088 | 1.9367 | 9.1630 |
| **Total** | 34.6688 | 8.1195 | 2.8738 | 45.6621 |

| 1997 | Non | Mid | High | Total |
|---|---|---|---|---|
| **RAGS** | 25.2299 | 6.5742 | 0.6468 | 32.4508 |
| **RNAS** | 5.7269 | 1.3544 | 0.1284 | 7.2097 |
| **RWAG** | 6.3003 | 1.4883 | 0.1426 | 7.9313 |
| **UAGS** | 1.3204 | 0.6095 | 0.4134 | 2.3433 |
| **UNAS** | 4.0893 | 1.7584 | 1.1731 | 7.0208 |
| **UWAG** | 4.0065 | 1.6851 | 1.1237 | 6.8153 |
| **Total** | 46.6733 | 13.4699 | 3.6280 | 63.7713 |

*Note*: Non=Non-skilled labour, Mid=Mid-skilled labour, High=High-skilled labour
RAGS=Rural agricultural self-employed household, RNAS=Rural non-agricultural self-employed household, RWAG=Rural wage-earning household, UAGS=Urban agricultural self-employed household, UNAS= Urban non-agricultural self-employed household, UWAG=Urban wage-earning household
*Source*: Own calculations, with data drawn from Vietnam Social Accounting Matrix 1997 and 2000

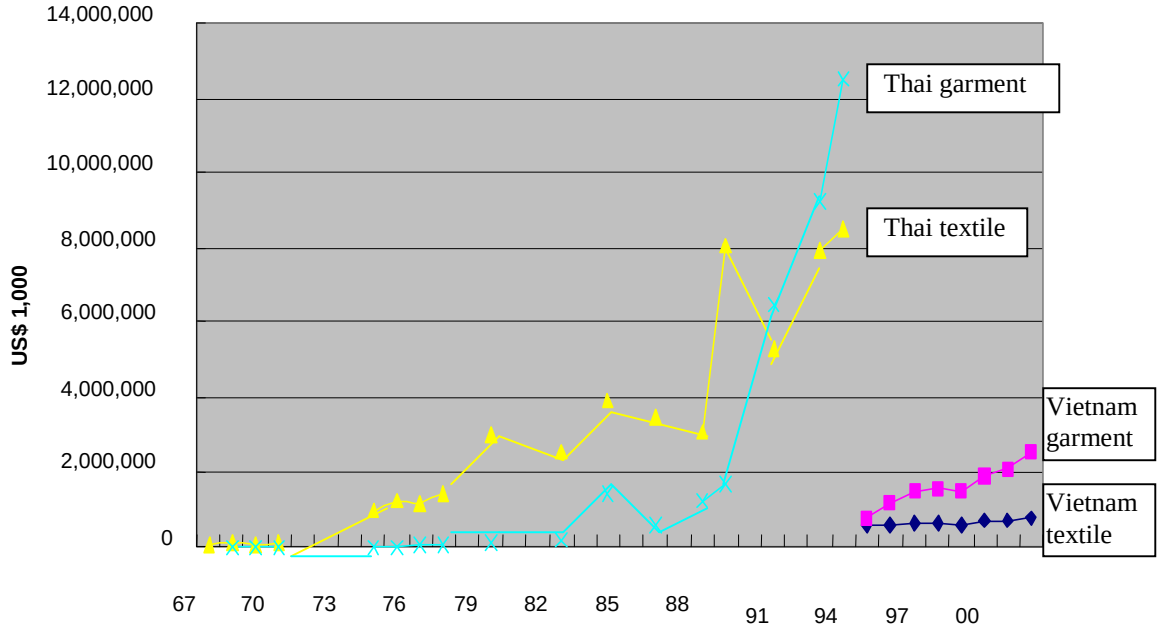
Table 8 shows how an increase in final demand (economic growth) for the economy as a whole would have increased the domestic value added of the three labour categories and in turn how their value added increase would have been distributed to

the six household categories. For example, in 1997 the increase of final demand by 100 billion Vietnamese dong would have induced the increase of the domestic labour value added of 63.77 billion Vietnamese dong, resulting in 46.67, 13.47 and 3.63 billion Vietnamese dong for non-skilled, semi-skilled and high-skilled labour, respectively, and the value added of each labour category would have been distributed to the different categories of households as shown in the table.

The comparison of the two years underscores the following three points. First, in 2000 the same 100 billion Vietnamese dong rise in final demand would have increased the labour value added only by 45.66 billion Vietnamese dong for the economy, which is 18.11 billion less than the 1997 amount. Second, the decrease in labour value added was largely the result of the decline in non-skilled and, to a lesser extent, semi-skilled labour value added. Last and most importantly, those declines mainly reduced the share of rural household incomes, especially rural agricultural and wage-earning households, while increasing the income shares of most urban household categories. Since in the four export sectors a large share of the non- and semi-skilled labour force is based in rural areas, the reduction of their value added must have contributed to the declining share of rural household incomes, or reinforced this economy-wide outcome, considering their significant combined weight in the economy, in terms of output and exports. The declining income shares of rural households, however, may have been mitigated by remittances from workers in urban areas.

*Comparison with the experiences of other countries.* Is the above development pattern a recent phenomenon or also experienced by countries, which had once successfully developed labour-intensive industries, before being able to create substantial linkages with domestic supply sectors? If the latter is the case, Viet Nam may be simply in a transitional stage and, as predicted by Hirschman, may be able to increase the domestic value added after the amount of imported materials crosses the threshold of minimum economic size. If the phenomenon is unique to Viet Nam or recent developing countries, the underlying force which shapes this development pattern needs to be explained. This section compares Viet Nam with Thailand and other Asian countries in the development of the textile and garment industries, which are often the entry points of industrialization for many countries.

**Figure 4. Output growth of the textile and garment sectors in Thailand and Viet Nam**




Source: UNIDO statistics, GSO statistical yearbook, various years.

As illustrated in figure 4, in Thailand the growth of textiles superceded that of garments, which took off only after a sizable output volume was reached by the textile sector. In contrast, Viet Nam has so far experienced steady growth only in the garment sector. Since growth of garment sector requires increased inputs from textile sector, though the latter can grow without the former, the figure confirms this requirement. The differences between the two countries become even clearer when the domestic value added of their garment outputs is compared.

Table 9 shows the shares of import and domestic value added of Thailand's garment sector since 1975. As can be seen, the share of domestic value added decreased from the high point of 85 per cent in 1975, but since 1990 it has maintained the share of around 70 per cent.

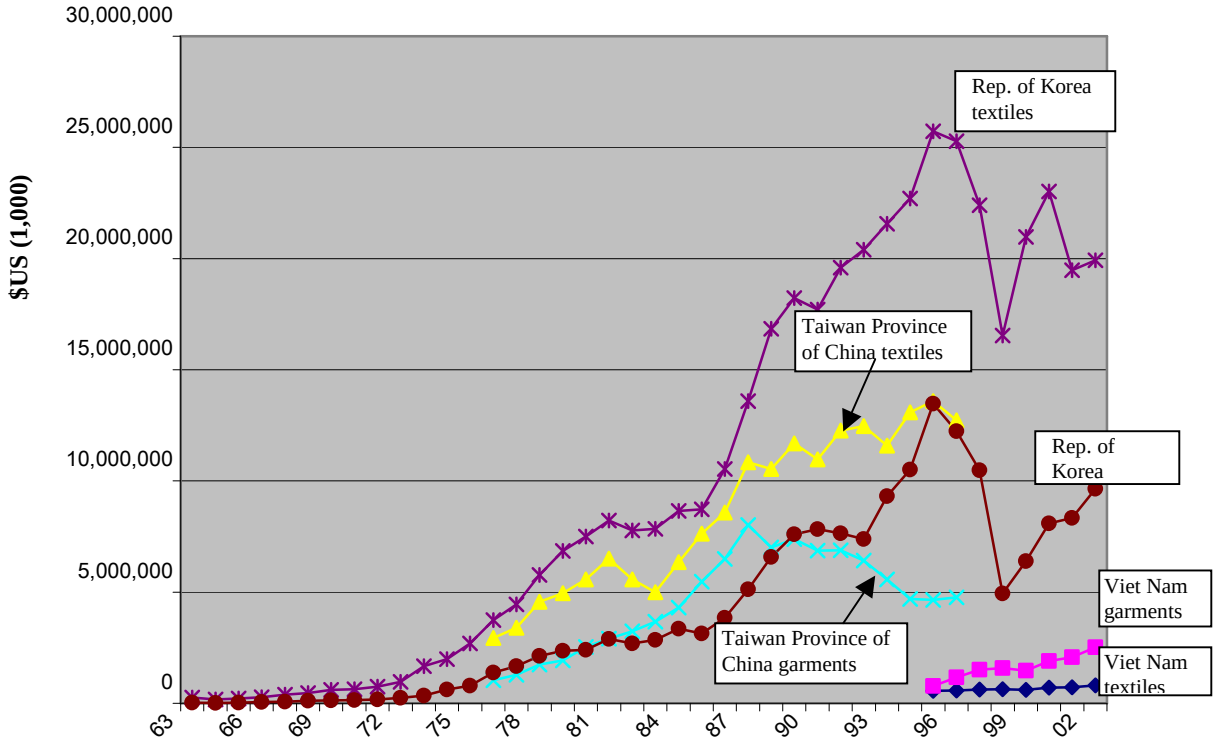
**Table 9. Imports and domestic value added in one unit of garment output in Thailand**

| Type | 1975 | 1980 | 1985 | 1990 | 1995 | 1998 | 2000 |
|---|---|---|---|---|---|---|---|
| Import | 0.1480 | 0.2683 | 0.2069 | 0.3063 | 0.2814 | 0.2737 | 0.2887 |
| Domestic value added | 0.8520 | 0.7317 | 0.7931 | 0.6937 | 0.7186 | 0.7263 | 0.7113 |
| Labour | 0.2838 | 0.2137 | 0.2264 | 0.2554 | 0.2427 | 0.2487 | 0.2178 |
| Capital | 0.5019 | 0.4414 | 0.4997 | 0.4152 | 0.4444 | 0.4328 | 0.4580 |
| Tax | 0.0663 | 0.0766 | 0.0670 | 0.0231 | 0.0315 | 0.0448 | 0.0355 |

*Source*: Own calculations based on Thai input-output tables of 1975, 1980, 1985, 1990, 1995, 1998 and 2000.

Garment production in Viet Nam in 2000 was roughly equal to the volume produced by Thailand in 1990. With a similar volume of production, Thailand's share of domestic value added was around 70 per cent in 1990, while Viet Nam's share was only around 30 per cent in 2000 (tables 5 and 9). Even with a smaller output prior to 1990, Thailand had much higher linkages with domestic suppliers. In 1990, production of US$100 worth of garments in Thailand would have increased the value added of the domestic textile sector by US$58, while the same amount of production in Viet Nam in 2000 would have increased the value added of Viet Nam's textile sector only by US$29. Even though Thailand seems to have had a more capital-intensive production structure relative to Viet Nam, due to the higher share of domestic value added, the share of labour contribution to value added was higher in Thailand than in Viet Nam.

**Figure 5. Textile and garment outputs of Republic of Korea, Tawian Province of China and Viet Nam**




*Note*: The production data for Taiwan Province of China are available only until 1996.

*Source*: UNIDO statistics, GSO statistical yearbook, various years.

As shown in figure 5, the pattern of output growth of the Republic of Korea and Taiwan Province of China is similar to that of Thailand. The output of textiles was always larger and grew faster than the output of garments. Especially in the case of Taiwan Province of China, the growth in textile production has continued even after garment production started declining. The technical coefficients based on input-output data for the Republic of Korea in 1989 and for Taiwan Province of China in 1986 indicate that they too had a high domestic value added for their garment production (Michigan model of world production and trade, 1998).

Even though the data available for Viet Nam, which cover a very short period, prevents us from making a conclusive statement, it appears that the development pattern of the Vietnamese textile and garment industries is characteristically different from that observed in the newly industrializing countries (NICs). Viet Nam's high

degree of concentration on garment production, while importing a large amount of textile materials, has been shaped by the way Viet Nam has been inserted into the global production chain. Looking at how this production is organized, the next section attempts to identify the underlying forces, which have made the development path of the Vietnamese garment industry different from that of NICs, and infer the prospects of linkage creation and technological deepening in the future.

**Viet Nam's garment industry in the global production network**

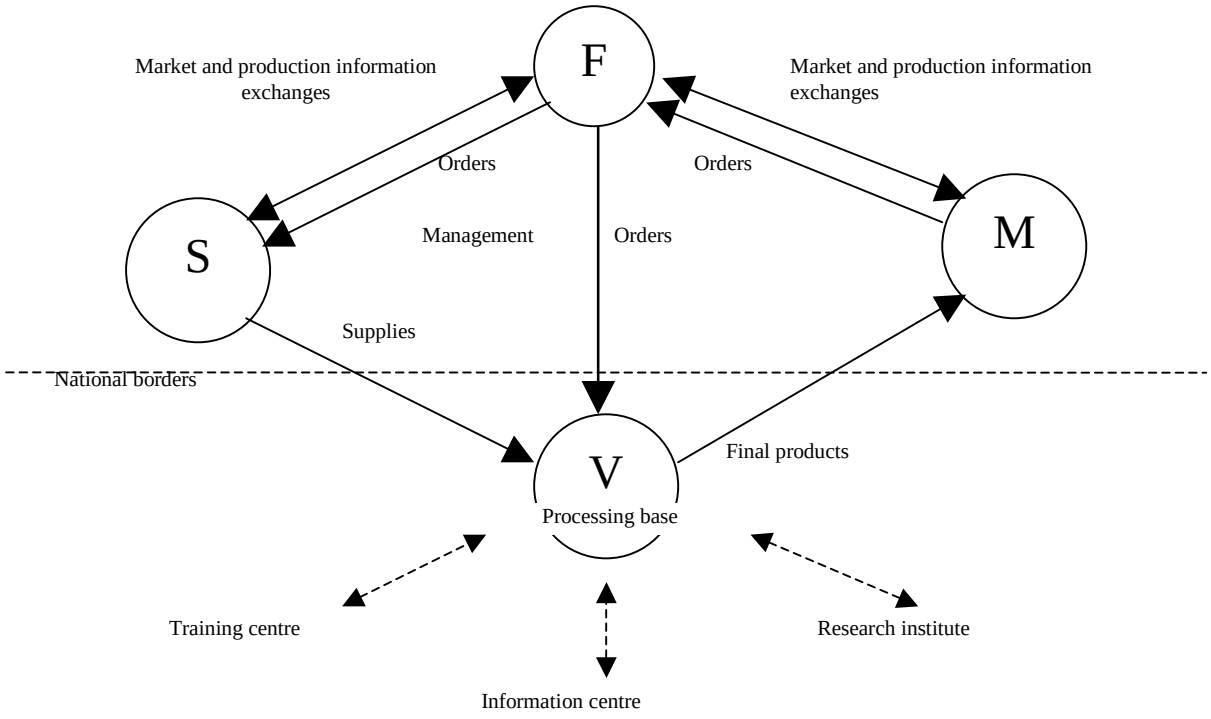
The majority of enterprises in the garment/textile sector in Viet Nam belongs to the small and medium enterprises (SMEs) category with the number of employees mostly between 5 and 200. Coexisting with this large number of SMEs are several dozens of large enterprises with more than 1,000 employees. In 2003, some 40 per cent of the sector's output originated from State-owned enterprises (SOEs), and the rest from foreign enterprises and domestic non-SOEs, with approximately an equal proportion of 30 per cent each. Within the garment/textile sector, SOEs' operation is concentrated in the textile sub-sector, while domestic non-SOEs have higher outputs in the garment sub-sector. The production volume of foreign enterprises is approximately equally divided among both sub-sectors. In international trade, Viet Nam focuses on garment production where it engages in cutting, making and trimming--downstream stages of the clothes production chain.

Despite its export orientation, due to dependence on imported materials, the sector's net contribution to foreign exchange is very limited. Calculations based on the Social Accounting Matrix suggest that even though around 77 per cent of total output was exported in 2000, this sector's net contribution to foreign exchange equals only 10 per cent of the output value. The high import dependency on materials and limited local value added underscore the industry's technological underdevelopment in upstream activities of production chain. Viet Nam is competitive in the garment sector where production is relatively labour-intensive; technology is less sophisticated; and initial investment is lower. The current comparative advantage in this downstream sector ensured the successful insertion of the Vietnamese industry into the global supply chain as sub-contractors. However, the success in garment production and

concentration in sub-contract functions have probably detached the industry from upstream and further downstream technology and market information.

To illustrate the problem, figure 6 below presents a simplified production structure in which most Vietnamese garment enterprises currently operate.

**Figure 6. Production structure of current garment enterprises**




The letters in the circles indicate the actors in the production chain as follows.
F – foreign production organizers
S – suppliers of materials and equipment
M – marketers / traders/ retailers
V – Vietnamese subcontractors

*Source*: Author.

Within the production process, Vietnamese enterprises take part strictly in the processing operation at the final stage with no additional value, in terms of production and management, as these functions are usually carried out by foreign production organizers outside Viet Nam. Specifically, foreign enterprises receive orders from, customers and place orders, with material suppliers. They coordinate the entire production process and assume ownership for materials processed by the Vietnamese.

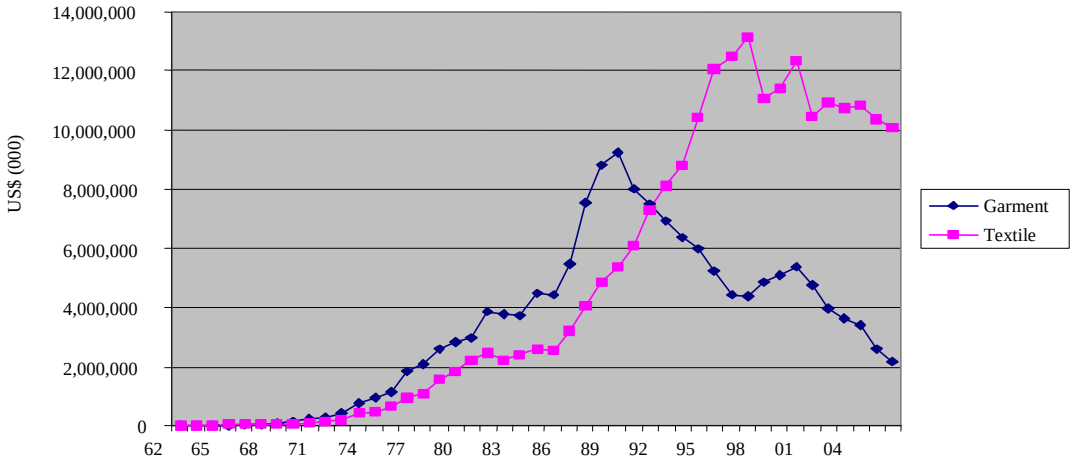
In essence, the Vietnamese operation space is narrowly confined to processing "borrowed" materials under foreign management oversight and shipping of final products to markets predetermined by, and on behalf of, foreign production organizers. These foreign organizers are often from NICs, that once enjoyed comparative advantage in garment exports, but as their labour costs increased they evolved from producers of garments into managers of buyer-driven value chain, a function that is more profitable and sustainable.

Based on international trade theory, moving up the value chain by NICs and entry of Viet Nam at the bottom of the chain through global integration are beneficial to both parties and to the world as it increases allocative efficiency. Indeed, trade opportunities promoted by preferential trade arrangements and investments from NICs have had favourable effects on the Vietnamese economy, at least to the extent of the net increase in employment and value added. Thus, the question here is not of whether there have been any welfare benefits to the country at all as a result of following this particular development path, but whether this path, characteristically different from the one of NICs, is also capable of bringing dynamic effects, such as providing opportunities for linkage creation with domestic suppliers and for technological upgrading, as seen from the experiences of NICs. Even though the input-output analysis and country comparisons in this paper illustrate what has happened so far, obviously due to the limited period of data availability they do not provide enough evidence to answer the above question. Thus, this section attempts to identify the underlying forces working within the structure of figure 6, and see if they are conducive to bring about the dynamic effects.

As illustrated in figure 6 above, foreign production organizers, mainly from NICs, play a key role in the global production network in which Viet Nam participates. This network has been driven by responses of NICs to their rising labour costs, international trade regime for garments and textiles, and increasing demand from retailers. The rising labour costs and sharp appreciation of their local currencies at the end of 1980s ended their continuous export expansion of garment products, but at the same time triggered the process of industrial upgrading based on building production and distribution networks between buyers and sellers. As NICs began moving their production to countries with cheaper labour costs and unfilled quota for major

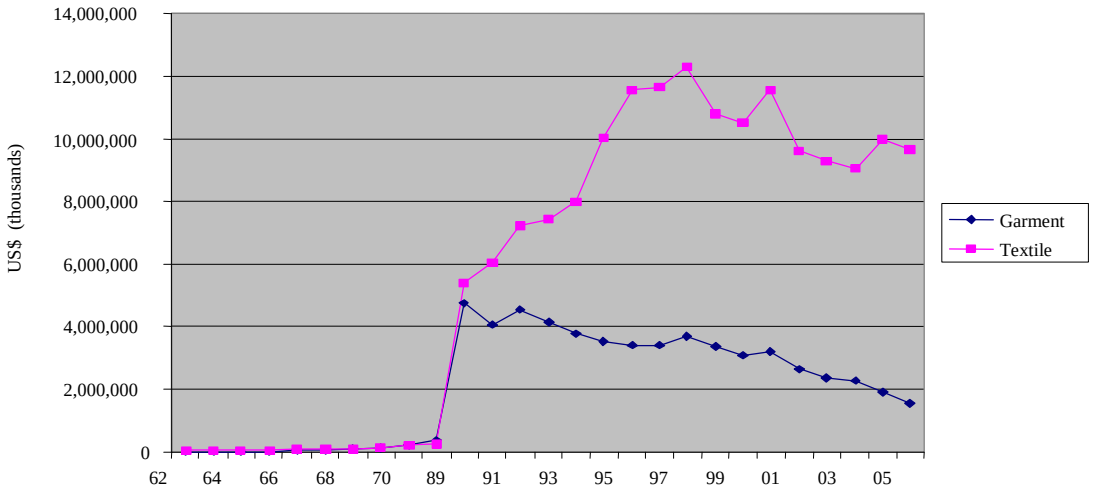
markets, they devised ways to coordinate and manage the sourcing networks they created (Gereffi, 1999). Thus, it was not the entire production system that NICs moved to low cost countries, but only the most labour intensive part of the value chain that was relocated offshore. Production linkages with their supply sectors remained intact with capabilities of processing production information and coordinating supplies and demands. Within the value chain, labour-intensive garment production was the first to move out of NICs, while they held on to more capital-intensive textile production, and used their offshore garment factories as outlets for their textile exports. As figures 7 and 8 illustrate, even though garment exports from the Republic of Korea and Taiwan Province of China peaked at the end of 1980s, their textile exports continued to increase until the latter half of the 1990s, and the decline in textile exports since then has been slower than that of garment exports.

**Figure 7. Garment and textile exports of the Republic of Korea**




*Source*: UN COMTRADE database.

**Figure 8. Garment and textile exports of Taiwan Province of China**




*Note*: The export data for Taiwan from 1972 to 1988 are not available in UN COMTRADE database.
*Source*: UN COMTRADE database.

Saving labour costs through plant relocation, while maintaining linkage with their more capital-intensive industries, was only one part of production reorganization that NICs have implemented. Another and more important development led by NICs was the upgrading of the production network logistics for better coordination using information technologies in order to meet the needs of the increasingly high-tech nature of global textile/garment production. Retailers do not necessarily place highest priority on low-cost production, but seek shorter lead time from order to delivery, product quality and compliance with labour standards by manufacturers. Retailers' priorities among these may change in accordance with the times. Amid multiple objectives to be satisfied, there is room for NICs to add higher values by improving the information flow and for ensuring better matching between demands and supplies building, while networking with both retailers and manufacturers.

For example, in figure 6 a Taiwanese firm in position *F*, which owns or has subcontract relations with manufacturing plants in multiple countries, may receive an order from a retailer, *M*, in New York. The company decides which manufacturer should fill the order and who should supply materials to the factory by considering the quality ratings of factories, quota availability of countries, as well as costs and delivery time (Thun, 2000). Utilization of advanced information technologies by

many Taiwanese firms helps them to reach optimal manufacturing and supply decisions and keep their clients informed of up-to-date production progress by tracking orders using their computer network. Increasing consciousness of labour conditions in garment plants by consumers has also created opportunities for firms in position *F* to add value of their products by implementing the approval process required by retailers and monitoring working conditions in factories. Due to the closer integration of individual actors, mentioned in figure 6, through advanced information technologies, foreign production organizers from NICs could shift production at any time between factories that had the required mix of labour, quality and turnaround time (Thun, 2000).

The production network, therefore, is coordinated by *F*, in figure 6, and information exchanges occur intensively between *F* and *M*, retailers, and between *F* and *S*, material suppliers. *M* transmits market and design information to *F*, while *S* provides *F* information on textile and accessory designs. The information flow to *F* from both *M* and *S* is processed by *F* in consultation with mainly *M* and *S*, and in turn production information is disseminated to *M*, *S* and *V*, Vietnamese sub-contractors. In this system, learning by firms to achieve higher value added occurs mainly among *M*, *F* and *S*, especially the first two. Responding to market incentives and pressure, they learn by seeking to develop better products or materials, and by interacting with these actors to constantly improve product quality, reduce costs, comply with accepted labour standards in manufacturing, and facilitate material and information flows in the production network (Gereffi, 1999). Severed from the market information and the interactive learning process in the system, *V* is largely a passive actor who carries out final processing according to production specifications. *V*'s learning is limited to learning-by-doing which would increase labour productivity, but the marginal returns from this learning would probably diminish rapidly.

This structure is efficient in terms of making the Vietnamese participate only in stages where they have comparative advantages and nothing else. Given the fast growth of their garment production, it is understandable that the Vietnamese have been willing to continue with the processing activities. The main concern is not so much the current concentration in the processing function per se, as the structural constraints preventing Vietnamese garment firms from upgrading their operations to start adding

higher values and from inducing the development of the domestic supply sectors and marketing expertise through linkages.

In order to strengthen technological capabilities, it might be worth establishing relevant research institutes, training centres and information centres, as illustrated in figure 6. Yet these alone do not promise to bring about the intended effects, as there will be few incentives and pressures for Vietnamese firms to use these services under the current structure. At best, the institutes and centres will be utilized at the margins of their operations, and will certainly not be the driving force of technological change. Facing growing processing businesses, the primary focus of the Vietnamese firms will be on doing more of the same thing, which do not require new technological capabilities, market information and design capabilities, and by doing so they will further consolidate their position as subcontractors.

**Conclusions**

This paper reviewed the growth of the Vietnamese export-oriented industries and the possible impact on welfare improvements through increases in employment, value added and linkages with domestic industries. Moving towards a market-oriented economy and actively participating in economic globalization, Viet Nam has increased its allocative efficiency. Besides, the country's advantage in cheap labour costs has been better utilized in the labour-intensive processing stages in global value chains. To that static extent, Viet Nam has benefited from the development of export-oriented industries.

Due to limitations in data it was not possible to draw a firm conclusion on the dynamic effects of the growth. However, comparative analyses indicate that in case of the garment/textile industry, the pattern of the Viet Nam's development has been characteristically different from that of earlier developing countries in the region. An investigation of the production network of garment production identified the underlying forces, which seem to hinder, rather than promote, learning activities and interactions, which are necessary for technological upgrading and linkage creation. Based on this analysis, the current limited and decreasing backward linkages between

export-oriented sectors, especially in the garment and footwear sectors, and their domestic suppliers are not likely to be temporary phenomena. Thus, it may not be a coincidence that recent emerging countries following a similar development path as Viet Nam, such as Bangladesh, Cambodia, Madagascar,and Sri Lanka, have experienced, by and large, insignificant inducement effects from the growth of export-oriented industries (Kelegama, 1999; Nicita, 2006; UNIDO, 2007). In contrast, countries, which built a strong textile sector before, or in parallel with, the growth of the garment sector, like Turkey and China, have been successful in creating linkages with domestic industries (Neidik, 2004).

Contrary to the unbalanced growth theory advocated by Hirschman (Hirschman, 1958), establishment of the last sector first by participating in the global value chain of garment production does not seem to spontaneously induce the development of the domestic supply sector through backward linkages even after reaching a significant level of garment outputs. However, this pattern of development does not necessarily need to be entirely rejected here. Participation in global value chains could offer attractive opportunities for industrialization and improvement of allocative efficiency for less developed countries with limited institutional, human and infrastructural capabilities. However, countries following this path may not reap as much benefits as earlier garment exporters.

In the post Multi-Fiber Arranggement era, especially after 2008 when the United States and the European Union will further liberalize their garment imports from China, competition among developing countries is likely to be further intensified, and the comparative advantage as a cheap processing base can be eroded quickly. Buyers are constantly looking for ways to reduce costs and risks involved in the current production structure. Foreign production organizers, for their part, are responding to demands by increasingly concentrating orders to the factories which can handle more pre- and post-production processes and risks, such as finding and buying proper materials for processing and providing export credits. In this regard, unless recent emerging countries develop stronger capabilities in material supply and production management, even their thriving processing businesses may not be sustainable in the near future, and those countries with a more integrated production system, such as China, may become more dominant at the expense of others.

**Appendix 1**.

To show direct transaction relations between industries, input coefficients were computed from transaction tables as follows. The coefficients used here do not separate domestic and foreign sources.

$$aij = \frac{xij}{xj} \qquad i = 1,2,\ldots\ldots n; \qquad j = 1,2,\ldots\ldots n$$

where aij is the input coefficient of sector j from sector i.

xj is the output of sector j

xij is the output of sector i used as input in sector j

While input coefficients illustrated the direct relations of the industry transactions, the real picture of inter-industry linkages can be revealed by looking at the ultimate effects of a sector on other industries. For example, an increase in a footwear sector requires more raw materials and industrial machinery, and in turn, the supply sectors have to increase their purchase of materials and machines necessary for the production. Finally, this ripple effect will spread to the bottom of the production chains which are only indirectly linked to the footwear sector. This whole web of linkages, including indirect effects, can be shown by the inverse matrices of input coefficients as follows. Two types of inverse matrices are calculated: non-competitive and competitive import types.

$$AX + F = X \qquad (1)$$

where A is the input coefficients matrix = $\begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & a_{ij} & \vdots \\ a_{n1} & \cdots & a_{nn} \end{bmatrix}$

X is the output vector = $\begin{bmatrix} X_1 \\ \vdots \\ X_n \end{bmatrix}$

F is the final-demand vector = $\begin{bmatrix} F_1 \\ \vdots \\ F_n \end{bmatrix}$

From equation (1), X can be derived as follows:

$$X = (I-A)^{-1}F \qquad (2)$$

I is the identity matrix. The term $(I-A)^{-1}$ is the inverse matrix of (I-A). Since A is the matrix of input coefficients computed without separating domestic and imported inputs, the inverse matrix is of the non-competitive import type.

If we include only domestically produced inputs in the technical coefficient so as to properly account the effects of imported inputs, it follows that:

$$AX+F^d+E-M=X \qquad (3)$$

where $F^d$ is domestic final demands

E is export

M is import

$$M=m(AX+F^d) \qquad (4)$$

m is an import coefficient, which is

$$m = \frac{Mj}{DDj} \qquad j = 1,2,\ldots\ldots n$$

Mj is import of sector j

DDj is domestic demand (including both final and intermediary) for sector j

Replacing the M in (3) with (4)

$$X=[I-(I-m)A]^{-1}[(I-m)F^d+E]$$

Shares of value added attributed to different origins can be calculated as follows:

For import: $MV=A^m[I-(I-m)A]^{-1}$

MV= share of value added attributed to import

$A^m=A-(I-m)A$

For domestic value added: $DV= V[I-(I-m)A]^{-1}$

DV = share of domestic value added

$$V = \frac{vj}{Xj} \qquad j = 1,2,\ldots\ldots n$$

where V is the row vector of value added coefficient

Vj is the value added of sector j

xj is the output of sector j

For tax: $TV = T[I-(I-m)A]^{-1}$

TV = share of value added attributed to tax

$$T = \frac{tj}{Xj} \qquad j = 1,2,\ldots\ldots n$$

where T is the row vector of tax coefficient

tj is the tax paid by sector j

xj is the output of sector j

## Appendix 2. Major suppliers of the four sectors and the linkages

| Leather and footwear industry | Total demand induced | | Domestic demand induced | | Rate of domestic supply | |
|---|---|---|---|---|---|---|
| | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 |
| **Leather goods** | 1.0552 | 1.4865 | 1.0308 | 1.3664 | 0.9769 | 0.9192 |
| **Textile (Weaving and Fibre)** | 0.1444 | 0.4015 | 0.0723 | 0.0860 | 0.5007 | 0.2142 |
| **Processed rubber and by products** | 0.1305 | 0.1740 | 0.0500 | 0.0713 | 0.3831 | 0.4099 |
| **Non-ferrous metals and products** | 0.0607 | 0.1456 | 0.0052 | 0.0171 | 0.0857 | 0.1178 |
| **Products of leather tanneries** | 0.0557 | 0.3805 | 0.0041 | 0.1178 | 0.0736 | 0.3095 |
| **Plastic** | 0.0534 | 0.1739 | 0.0001 | 0.0045 | 0.0019 | 0.0258 |
| **Gasoline, lubricants** | 0.0348 | 0.1364 | 0.0018 | 0.0043 | 0.0517 | 0.0316 |

| Garment industry | Total demand induced | | Domestic demand induced | | Rate of domestic supply | |
|---|---|---|---|---|---|---|
| | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 |
| **Ready-made cloths, sheets** | 1.0629 | 1.1368 | 1.0295 | 1.0764 | 0.9686 | 0.9468 |
| **Textile (Weaving and Fibber)** | 0.5834 | 1.0777 | 0.3033 | 0.2919 | 0.5199 | 0.2709 |
| **Non-ferrous metals** | 0.0858 | 0.1988 | 0.0085 | 0.0212 | 0.0991 | 0.1068 |
| **Gasoline, lubricants** | 0.0446 | 0.1191 | 0.0027 | 0.0030 | 0.0605 | 0.0251 |
| **Plastic** | 0.0164 | 0.2003 | 0 | 0.0035 | 0 | 0.0176 |

| Seafood industry | Total demand induced | | Domestic demand induced | | Rate of domestic supply | |
|---|---|---|---|---|---|---|
| | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 |
| **Processed seafood** | 1.1334 | 1.1957 | 1.1130 | 1.1731 | 0.9820 | 0.9811 |
| **Fishery** | 0.5536 | 0.6290 | 0.5406 | 0.6144 | 0.9765 | 0.9768 |
| **Non-ferrous metals** | 0.0453 | 0.1404 | 0.0049 | 0.0289 | 0.1082 | 0.2060 |
| **Gasoline, lubricants** | 0.0253 | 0.2783 | 0.0017 | 0.0196 | 0.0672 | 0.0705 |
| **Plastic** | 0.0094 | 0.0813 | 0 | 0.0028 | 0 | 0.0340 |

| Processed wood industry | Total demand induced | | Domestic demand induced | | Rate of domestic supply | |
|---|---|---|---|---|---|---|
| | 1997 | 2000 | 1997 | 2000 | 1997 | 2000 |
| **Processed wood** | 1.4232 | 1.0468 | 1.3765 | 1.0367 | 0.9672 | 0.9904 |
| **Forestry** | 0.2878 | 0.5894 | 0.2486 | 0.5022 | 0.8638 | 0.8521 |
| **Non-ferrous metals** | 0.1016 | 0.0703 | 0.0152 | 0.0097 | 0.1496 | 0.1381 |
| **Gasoline, lubricants** | 0.0471 | 0.1281 | 0.0033 | 0.0081 | 0.0701 | 0.0629 |
| **Paper & pulp products** | 0.0327 | 0.0606 | 0.0164 | 0.0271 | 0.5015 | 0.4473 |
| **Plastic** | 0.0115 | 0.0438 | 0 | 0.0012 | 0 | 0.0273 |

*Source*: Own calculations, with data drawn from the Vietnam Social Accounting Matrix 1997 and 2000.

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