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Manufacturing Exports and Employment Generation in Vietnam

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Abstract

This study investigates the effect of export expansion on employment generation in the context of the market-oriented economic reform implemented in Vietnam since the early 1990s. Following a stage-setting survey of manu-facturing performance and employment generation in the reform era, it under-takes an empirical analysis using a standard inter-industry input-output frame-work to examine the contribution of manufacturing exports to job creation, employing Input-Output tables for Vietnam in 2000 and 2007. The findings show that manufacturing exports created about seven million new jobs between 2000 and 2007 through direct effects on the manufacturing sector, as well as through spillover effects across sectors in the overall economy. In particular, export-oriented manufacturing contributed over half of the total increase in manufacturing employment during the period 2000-07.

Keywords: Export-oriented Industrialization, Input-output Framework, Manufacturing Exports, Employment, Vietnam

1. Introduction

It is widely accepted that employment creation is an important objective of economic development in a labour-abundant economy. There is a sizeable literature on the role of export expansion in job creation in labour-abundant developing economies in East Asia at the early stages of development. An industrialization of these economies indicates that an export-oriented strategy has facilitated labour absorption. A policy shift towards export promotion has allowed these economies to exploit the comparative advantages of labour-intensive goods. Export expansion thus becomes a powerful contributing factor to employment growth.[2]

The experience of Vietnam has not been adequately studied. The previous studies have focused mainly on employment transformation and its growth under the policy transition from a centrally planned to a market-oriented economy during the past quarter century (Athukorala, Manning & Wickaramasekara 2000; Belser 2000; Lim 2014). Only a few studies have investigated the employment effect of international trade and foreign direct investment (Fukase 2013; Jenkins 2004, 2006; Kien & Heo 2009; Lim 2011; Vu et al., 2012). None of these studies has paid attention to the impact of export-oriented strategy on sectoral employment patterns.

The purpose of this study is to examine the impact of export expansion on employment generation in Vietnam. It does so by employing an inter-industry input-output framework to examine the contribution of manufacturing exports to employment creation, using Input- Output tables for 2000 and 2007. Two issues are addressed: the overall pattern of employment stimulated by manufacturing exports, and the number of jobs created through its export expansion.

An extended Heckscher-Ohlin trade model (Krueger 1983; Krueger et al., 1981) postulates that a labour-abundant economy should specialize in labour-intensive manufacturing for exports in order to fully exploit its factor abundance. At the outset of development, this economy exports natural-resource-based goods and imports manufacturing goods, owing to the small capital stock as well as to the lower productivity of labour. As capital

[2] For empirical evidence of the impact of export expansion on employment creation see Athukorala & Santosa (1997); Balassa (1985); Booth (1999); Fujita & James (1997); Ranis (1973); Suphachalasai (1995)

accumulation increases, labour moves into a newly developed manufacturing industry, and then gradually the economy becomes a net exporter of manufacturing goods. Furthermore, recent studies provide support for the employment effect of trade expansion in these developing countries (Edwards 1988; Fu & Balasubramanyam 2005; Milner & Wright 1998; Wood 1994). Therefore, labour-abundant developing economies should make use of export markets in order to fully benefit from the economies of scales in labour-intensive manufacturing (Booth 1999).

The empirical analysis in this study is based on the standard input-output framework. The advantage of this input-output analysis is that it takes into account both direct and indirect (inter-sectoral) consequences of export expansion on employment for the overall economy. In particular, an employment multiplier derived using the input-output coefficients helps us to examine the contribution of the expansion of manufacturing exports to employment generation.

The findings in this study show that during 2000-2007 export-oriented manufacturing contributed more than half of the total increase in manufacturing employment. Aside from this direct effect of export expansion, there have been considerable spillover effects of export expansion on employment creation in other sectors. Overall, the Vietnamese experience of employment expansion through export-led industrialization is consistent with the experience of other East Asian economies.

This paper is organized as follows. Section 2 discusses the changing structure of Vietnamese manufacturing in terms of output and employment. Section 3 analyzes the relative importance and composition of manufacturing exports in total exports. Section 4 examines the impact of manufacturing exports on employment growth using the Input-Output (I-O) tables of Vietnam for 2000 and 2007. The final section summarizes the findings.

2. Structural change in the manufacturing sector

The analysis in this paper covers 21 manufacturing industries identified at the two-digit level of the Vietnamese Standard Industry Classification (VSIC).[3] Refined petroleum and gas (VSIC 23) is excluded because of

[3] VSIC denotes the Vietnamese Standard Industry Classification. This nomenclature is consistent with the International Standard Industry Classification (ISIC).

possible distortions resulting from price fluctuations. Disaggregated data by two-digit industries show a notable compositional change in this sector over the period 1995-2009 (Table 1). As a backdrop to the subsequent analysis, several interesting features deserve comment.

Table 1: Structural change in manufacturing output in Vietnam, 1995-2009 (in%)

Manufacturing industries by a two-digit VSIC*	Composition[a]			Growth rates[b]		
	1995	2000	2009	95-99	2000-09	1995-2009
15: Food products and beverages	32.4	27.6	24.2	8.7	14.7	13.0
16: Manufacture and tobacco products	4.8	3.6	1.9	4.8	8.4	8.1
17: Manufacture of textiles	7.4	6.4	4.6	8.0	12.2	11.5
18: Manufacture of wearing apparel	3.5	3.8	4.6	15.3	18.8	17.6
19: Manufacture of leather products	4.3	5.6	4.9	21.3	14.7	16.5
20: Manufacture of wood and wood products	4.0	2.3	2.1	-1.1	15.5	10.4
21: Paper and paper products	2.3	2.5	2.7	15.5	17.4	16.6
22: Publishing and printing	1.8	1.4	1.1	7.4	12.7	11.2
24: Chemical and chemical products	6.1	7.0	0.1	17.5	14.8	15.5
25: Rubber and plastic products	2.7	4.1	6.2	24.3	20.9	21.7
26: Manufacture of non-metallic mineral products	11.0	11.5	5.7	12.6	13.5	13.9
27: Manufacture of basic metals	4.1	3.7	9.2	9.9	16.9	14.9
28: Fabricated metal products	2.8	3.6	3.9	21.2	23.0	21.8
29: Machinery and equipment	1.6	1.7	6.0	12.6	13.7	14.3
30: Office, accounting and computing machinery	0.0	0.8	1.4	179.5	24.2	51.2
31: Electrical machinery and apparatus	1.3	2.3	1.5	28.3	23.1	24.6
32: Radio, television and communication equipment	2.5	2.8	3.8	17.9	15.0	15.4
33: Medical, precision and optimal instruments	0.2	0.3	2.5	18.2	26.2	22.5
34: Motor vehicles, trailers and semi trailers	1.8	2.0	0.6	6.0	22.4	20.5
35: Manufacture of other transport means	2.3	4.1	3.2	24.7	20.2	22.8
36: Manufacture of furniture, n.e.c	2.4	2.5	5.4	14.6	23.1	20.1
Labour-intensive sector[c]	18.3	20.3	26.3			
Whole of manufacturing				12.6	16.4	15.4

Notes: (a) Ratios are calculated based on the 1994 constant price.

(b) Average annual growth rate over the period on the 1994 constant price.

(c) Labour-intensive sector includes traditional labour-intensive industries (VSIC 18, 19, 20 & 36) and the electronics industry (VSIC 30-33).

Source: Compiled from C.E.I.C. Asian database, 2012.

The most striking feature of Vietnamese manufacturing is the dominance of the processed food industry (VSIC 15); this accounted for more than a quarter of total manufacturing output over the period 1995-2009. The next largest share of output is held by industries in the labour-intensive sector,[4] which since 2000 has accounted for more than 20 per cent of the total. Of these labour-intensive industries, in terms of output the most important are furniture (VSIC 36), footwear (VSIC 19) and apparel (VSIC 18). The share of the electronics industry has risen erratically since the early 2000s but has remained quite small.

A second major feature is the diversification of manufacturing output. Between 1995 and 2009, the share of resource-based industries, such as processed foods (VSIC 15), chemical products (VSIC 24), and non-metallic mineral products (VSIC 26), in total manufacturing output declined sharply. Typically, the processed food industry share of total output fell steadily, from 32 per cent in 1995 to 28 percent in 2000 and to 24 percent in 2009. The decline in manufacturing output in these industries was replaced by a rising share of capital- intensive industries in manufacturing output. The output share of basic metals (VSIC 27), for example, shifted from just above four per cent in 1995 to about nine per cent by 2009.

Structural change in Vietnamese manufacturing has been accompanied by a changing composition in employment. Table 2 presents data on the growth and composition of manufacturing employment. Employment generation is mainly concentrated in the traditional labour-intensive industries, the electronics industry,[5] and the processed food industry. The traditional industries include apparel, footwear, and furniture: all are labor-intensive and highly export-oriented. As in the electronics industry, some of the component production and assembly industries, such as office, accounting and computing machinery (VSIC 30), and radio and television equipment (VSIC 32), grew quickly (30 per cent and 20 per cent per annum, respectively) over the period 2000-09, after starting from a very small base. The processed food industry

[4] The labour-intensive sector includes traditional labour-intensive industries (18,19, 20, & 36) and the electronics industry (VSIC 30-33).

[5] The electronics industry is mainly involved in labour-intensive assembly and packaging activities in Vietnam. Thus, it can be considered a labour-intensive one.

(VSIC 15), unlike other resource-based industries, has had a high level of job creation over that period. The employment share of processed foods declined slightly over the period 2000-09, but this was still comparable with that of the traditional labour-intensive industries.

Table 2: Manufacturing employment in Vietnam: composition and growth, 2000-2009 (in %)

Manufacturing industries by a two-digit VSIC	Composition			Growth rates[b]
	2000	2004/05[a]	2009	2000-09
15: Food products and beverages	16.8	14.1	12.9	7.9
16: Manufacture and tobacco products	0.8	0.5	0.3	1.3
17: Manufacture of textiles	7.7	5.6	4.8	5.5
18: Manufacture of wearing apparel	14.5	17.1	18.5	14.2
19: Manufacture of leather products	18.6	17.7	14.7	8.3
20: Manufacture of wood and wood products	4.0	3.8	3.1	8.1
21: Paper and paper products	2.3	2.2	2.1	10.0
22: Publishing and printing	1.4	1.4	1.5	11.9
24: Chemical and chemical products	4.1	2.6	2.9	7.1
25: Rubber and plastic products	3.2	3.7	4.3	14.7
26: Manufacture of non-metallic mineral products	8.0	7.4	6.9	9.3
27: Manufacture of basic metals	1.8	1.4	1.6	9.8
28: Fabricated metal products	3.2	4.2	5.1	17.1
29: Machinery and equipment	1.9	1.5	1.7	9.3
30: Office, accounting and computing machinery	0.2	0.3	0.8	31.0
31: Electrical machinery and apparatus	2.5	2.5	2.8	12.7
32: Radio, television and communication equipment	1.0	1.1	2.1	20.3
33: Medical, precision and optimal instruments	0.4	0.4	0.4	11.2
34: Motor vehicles, trailers and semi trailers	1.0	1.2	1.4	15.6
35: Manufacture of other transport means	2.5	2.9	3.3	14.6
36: Manufacture of furniture, n.e.c	4.1	8.1	8.6	20.6
Labour-intensive sector[c]	45.3	50.9	51.1	
Whole of manufacturing				11.1

Notes: (a) Two-year averages.

(b) Average annual growth rate over the period 2000-2009.

(c) the labour-intensive sector includes traditional labour-intensive industries (VSIC 18,19, 20 & 36) and the electronics industry (VSIC 30-33).

Source: Compiled the *GSO Enterprise Survey* 2000-09.

Two notable relationships between output, exports and employment emerge from Table 2. First, the labour-intensive industries accounted for only about 20 per cent of the total output yet contributed to more than half of the total number of manufacturing workers employed during the period 2000-09. Second, these labour-intensive industries (namely apparel, footwear, and furniture) figured prominently in export performance, with their combined shares accounting for 40 per cent of total non-oil exports in 2009. (I will return to this in the discussion of export patterns.) This is similar to the situation in the 1950s and 1960s, when the present-day industrialized economies in East Asia began their economic development following export-led growth strategies, and when traditional labour-intensive manufacturing was the main growth area for jobs (Fujita & James 1990; Hong 1981; Watanabe 1972). From this relation, I can postulate that this export expansion could translate into higher employment in Vietnam.

Labour-intensive industries and the processed food industry together contributed more than half of Vietnam's total manufacturing employment for the period 2000-09. This has stimulated a shift in labour away from the low-wage agricultural sector into the higher-wage manufacturing sector, a pattern consistent with the East Asian experience. Hence, it is important to examine how Vietnam's export patterns have evolved following the economic reform.

3. Export patterns

Table 3 summarizes the data on export performance by each major merchandise group over the period 1990-2011. Manufacturing products have been identified based on the VSIC classification system, to make the data comparable with the discussion on the changes in the output composition of manufacturing in the previous section. The major difference between VSIC and the Standard International Trade Classification (SITC) is that the former identifies processed foods as part of manufacturing (industrial) goods, whereas the latter combines processed foods with primary food products. In countries such as Vietnam, which have significant agricultural and marine resources, the impetus for export expansion most likely originates from an increase in the production of processed foods such as fish products, coffee extracts, and

processed fruits (Athukorala & Sen 1998). Therefore, the VSIC classification system, which incorporates a processed food category[6] as a part of manufacturing goods, is more appropriate for analyzing the performance of manufacturing exports from Vietnam.

Table 3: Vietnam's export growth, 1990-2011 (in %)

	1990-1994	1995-99	2000-11	1990-2011
(a) Growth rate (% p.a.)				
Primary products	14.0	-16.9	19.8	9.8
Manufacturing exports[a]	14.6	36.9	21.1	23.6
Total non-oil exports[b]	14.0	14.2	21.0	18.7
(b) Contribution to incremental in export growth (%)				
Primary products	61.6	-44.5	11.9	10.7
Manufacturing exports	39.5	144.0	87.5	88.7
Total non-oil exports	100	100	100	100

Notes: (a) The original export data based on the Standard International Trade Classification (SITC) are converted into VSIC. The value of VSIC-based manufacturing exports is approximately equal to SITC 5-8, less SITC 68 (non-ferrous metal) and plus processed foods.

(b) Non-oil exports: total exports less oil and gas exports (SITC 33, SITC 34).

Source: Compiled from C.E.I.C. Asian database, 2012 and UN Comtrade database.

Total non-oil exports from Vietnam grew at an average annual growth rate of about 19 per cent during the period 1990-2011. Of these exports, the average growth rate of manufacturing exports was nearly 24 per cent per annum; this growth contributed about 90 per cent of the overall export growth for same period. Meanwhile, the growth rate of primary produce exports was 14 per cent in the first period. This rate decreased sharply over the period

[6] Processed foods are separated from the SITC 0 (food and live animals), SITC 1 (beverages and tobacco) and SITC 4 (vegetable oils) using the classification system developed by Athukorala & Sen (1998).

1995-1999 before recovering to an average annual rate of around 20 per cent in the period since 2000.

The data reported in Table 4 shed light on the structural shift in the commodity composition of Vietnam's exports. Since the early 1990s, there has been a marked shift in the composition of exports away from primary products and toward manufacturing commodities. The speed of this shift in Vietnam has been modest compared with that in Taiwan and South Korea during their early stages of development, from the 1960s to the 1970s (Balassa 1985; Kuo & Fei 1985). In the early years of the reform process in Vietnam, the share of manufacturing exports in total non-oil exports was below 40 per cent (about US$ 0.9 billion) in 1990, but rose to above 88 per cent (above US$ 33 billion) in 2011.[7] It is important to note that traditional labour-intensive products – especially apparel, furniture and footwear (all classified as miscellaneous manufacturing) – have played a significant role in manufacturing exports, accounting for one-third of non-oil exports. The processed foods industry recorded a remarkable share (above 15 per cent) of total non-oil exports from 2000.

The data in Table 5 reveal three noteworthy features of compositional shifts in manufacturing exports over the period 2000-11. First, the traditional labour-intensive manufacturing exports – especially clothing (VSIC 18), furniture (VSIC 26) and footwear (VSIC 19) – have grown the most rapid growth over that period. This product category accounted for more than 40 of the total VSIC-based manufacturing exports during the period 2000-11, and contributed as much as a third of the non-oil manufacturing export increment. Second, the processed food industry have contributed more than 14 per cent of the total manufacturing export increment during the examined period, despite a steady decline in its share.

Finally, the share of electronics products in the total manufacturing exports began to increase rapidly in the early 2000s. This category accounted for 19 per cent of the overall growth of non-oil manufacturing exports over the period 2000-11. To some extent, this trend is an early sign of Vietnamese manufacturing joining global production network. Typically, the growth of

[7] These export data are measured in current prices.

telecommunications and sound recording equipment (VSIC 32) has been rather erratic, and in 2011 these products accounted for a high share of total manufacturing exports

Table 4: Composition of exports, Vietnam, 1990-2011

	1990	1995	2000	2011
Export value (US$ million at current prices)				
Total non-oil exports	2,404	5,449	10,754	87,609
Primary products	1,481	3,257	1,453	10,617
Manufacturing exports	901	2,192	9,273	76,500
Processed foods	200	407	2,897	13,823
Chemicals	18	31	159	2,876
Resource-based manufactures	107	350	889	10,445
Machinery and transport equipment	1	89	1,276	18,835
Miscellaneous (labour intensive products)	575	1,315	4,052	30,521
Unclassified	22	0	6	63
Percentage of total exports (%)				
Primary products	61.6	59.8	13.5	12.1
Manufacturing exports	37.5	40.2	86.2	87.3
Processed foods	8.3	7.5	26.9	15.8
Chemicals	0.7	0.6	1.5	3.3
Resource-based manufactures	4.5	6.4	8.3	11.9
Machinery and transport equipment	0.0	1.6	11.9	21.5
Miscellaneous (labour- intensive products)	23.9	24.1	37.7	34.8
Unclassified	0.9	0.0	0.1	0.1

Notes: Processed foods are separated from the SITC 0 (food and live animals), SITC 1 (beverages and tobacco) and SITC 4 (vegetable oils) using the classification system developed by Athukorala and Sen (1998). This system was defined using a commodity concordance linking Standard International Trade Classification (SITC) and International Standards Industrial Classification (ISIC). The comparable sections in the ISIC are industry groups 15-16.

Source: Compiled and calculated from C.E.I.C. Asian database, 2012 and UN Comtrade database.

Table 5: Manufacturing exports: Composition and growth in Vietnam, 2000-2011 (in %)

Manufacturing exports by a two digit VSIC	Composition			Growth rate[a]	Contribution[b]
	2000	2006	2011	2000-2011	
15: Food products and beverages	27.7	20.2	16.1	16.0	14.7
16: Tobacco products	0.1	0.4	0.3	34.8	0.3
17: Manufacture of textiles	4.7	7.1	8.2	28.0	8.6
18: Wearing apparel	19.7	18.1	13.7	17.9	12.9
19: Leather products including footwear	19.1	15.6	10.7	15.5	9.6
20: Wood products	2.1	1.8	1.8	20.1	1.8
21: Paper products	0.4	0.6	0.4	21.9	0.4
22: Publishing and printing	0.3	0.1	0.2	19.1	0.2
24: Chemical products	1.5	3.0	3.2	30.4	3.4
25: Rubber and plastic products	1.5	2.4	3.2	30.9	3.4
26: Non-metallic mineral products	1.7	1.8	1.7	22.0	1.7
27: Basic metals	0.8	1.6	3.6	40.0	4.0
28: Fabricated metal products	0.7	2.1	1.8	33.5	2.0
29: Machinery and equipment n.e.c	1.2	1.7	4.3	37.3	4.7
30: Office, accounting and computing machinery	5.6	4.5	1.2	5.9	0.6
31:Electrical machinery and apparatus	2.9	5.4	5.3	28.4	5.6
32: Radio, television & communication equipment	3.7	2.5	11.5	35.1	12.5
33: Medical, precision and optimal instruments	0.5	0.7	1.7	36.2	1.8
34: Motor vehicles, trailers and semi trailers	0.1	1.2	0.9	56.7	1.1
35: Manufacture of other transport means	1.1	0.8	1.5	25.5	1.6
36: Manufacture of furniture, n.e.c	4.6	8.6	8.6	28.8	9.1
Labour-intensive sector[c]	58.3	57.2	54.4		
Total VSIC-based manufacturing exports	100	100	100	21.8	100

Notes: (a) Average annual growth rate over the period 2000-2011.

(b) Contribution to manufacturing export growth over the period.

(c) The labor-intensive sector includes traditional labour-intensive industries (18,19, 20 & 36) and the electronics industry (VSIC 30-33).

Source: Compiled from UN Comtrade database, 2012.

Manufacturing exports from Vietnam are characterized by a high degree of import intensity at the early stages of development.[8] Some policy makers have interpreted the high level of imported intermediate inputs in export-oriented industries to be an obstructing factor for employment generation. However, in an open small developing economy, employing a large proportion of imported capital-intensive intermediate inputs for export production implies a substitution of labour for capital in production. This increases job growth through exports, even though domestic linkages are decreasing (Athukorala & Santosa 1997; Riedel 1975).

Regarding the employment potential of resource-based industrialization, the common argument is that capital expenses and raw materials occupy a high proportion of production costs in resource-intensive industries (Roemer 1979). But this is not the case for the processed food industry, which requires many labour-intensive tasks in its final processing stages (Athukorala & Sen 1998). Such export expansion enhances employment creation and creates greater linkages with the rural sector of the economy. These two views support the hypothesis of a strong association between export expansion and employment growth in the manufacturing sector. I test this hypothesis more explicitly in the next section.

It is evident that there is an association between export expansion and employment creation in Vietnamese manufacturing. But how much of this employment growth can be attributed to a surge in manufacturing exports? And has Vietnam followed in the footsteps of other labour-abundant East Asian economies where the rapid growth of labour-intensive manufacturing exports has triggered an employment transformation and driven growth in jobs?

4. Manufacturing exports and employment

In this section, I examine the impact of manufacturing exports on employment expansion using the input-output technique, a methodology has

[8] As in our own calculation, for manufacturing exports the processing and re-export of imported inputs represents over 50% of the total. The work is available from the author on request.

been widely used in the related literature.[9] This methodology is particularly suited to this purpose since it captures both direct employment (*i.e.* employment generated in exporting industries) and employment generated indirectly in other industries through inter-sectoral input-output linkages. Owing to the nature of data availability, this analysis focuses solely on the years 2000-07, when there was a pronounced shift of unskilled labour into manufacturing.

Method

In an input-output framework of the complementary import type, the import content of each transaction is separately identified and arranged into an import matrix. Thus, the following balance equation can be derived:[10]

$$X = A^d X + F^d + E \tag{1}$$

where X is the vector of total gross output, $A^d = [a_{ij}^d]$, $a_{ij}^d = X_{ij} / X_j$. is the domestic input-output coefficient matrix, and F^d and E are vectors of the domestic and export demand on domestically produced goods. Then, the following solution can be derived:

$$X = (I - A^d)^{-1} (F^d + E) \tag{2}$$

where $(- A^d)^{-1}$ is the Leontief domestic inverse matrix of the direct and indirect input requirements of good i in the production of one unit of the final demand for good j. The column-sums of the $(I - A^d)^{-1}$ maix are the direct and indirect, domestically produced intermediate input requirements per unit of final demand for good j which is defined as backward linkages (BL). In other words,

$$BL_j = \sum_j^n \tilde{a}_{ij}^d \tag{3}$$

[9] See Athukorala and Santosa (1997), Bulmer-Thomas (1982), Fujita and James (1997), Kuo (1983), and the works cited therein.

[10] For a summary exposition see Thirlwall (2006: Chapter 13).

where $\tilde{a}_{ij}^{d}$ is an element of the Leontief domestic inverse matrix. This index depicts the total demand for the intermediate input when domestic final demand or exports for the j^{th} commodity increases by one unit.

Next, to measure the employment implications of exports, I begin by defining a diagonal matrix of employment coefficients:

$$G = [g_i],\ g_i = G_i / X_i \qquad (4)$$

where G_i represents the number of workers employed in sector *i.* The empirical basis for the quantification of total employment in sectoral production can be obtained by

$$G(I - A^d)^{-1} = L \qquad (4)$$

where L is the total employment requirement matrix of domestic production. An element of this matrix, l_{ij}, indicates the increase in employment in sector i resulting from a unit increase in final demand for sector j. Therefore, when there is a unit increase in domestic final demand or in exports for sector j, the corresponding increase in total employment (l_{Tj}) is shown by $l_{Tj} = \sum_{i=1}^{n} l_{ij}$ *(j = 1,2...,n)*. This expresses a measure of the employment multiplier when domestic final demand or exports for the j^{th} commodity increases by one unit.

Let e_j refer to the value of total exports from sector j. Assuming that the level of employment required to produce a unit of output is identical whether the product is sold domestically or exported from sector j, then the total employment induced by exports in sector j, which is denoted by l_{Tj}^{e}, can be estimated as

$$l_{Tj}^{e} = l_{Tj} \,.\, e_j \qquad (6)$$

The aggregate export-induced employment of the economy (L_T) is, hence,

$$LT = \sum_{j} l_{Tj}^{e} \qquad (7)$$

Data

The estimates of export-induced employment are based on the I-O tables for 2000 and 2007 and on employment data taken from the Statistical Yearbooks and the Enterprise Survey, all conducted by the General Statistics Office of Vietnam (GSO). In order to examine the inter- sectoral repercussions of exports in employment growth, the I-O tables are aggregated into 25 sectors based on the multi-sector classification of the original I-O tables by the GSO.[11] The results are reported under five major sectors: agriculture, mining and quarrying, manufacturing, construction and public utilities, and services.

Before proceeding with the analysis, two cautionary comments about the quality of data are in order. First, the I-O tables are of the complementary import type, in which a corresponding import matrix with estimates of imported intermediate input transactions was provided by the GSO. Estimates of imported intermediate inputs by GSO were grounded on the implicit assumption that the distribution of imported inputs across all inputs was the same for every industry. Second, for the purpose of this analysis, employment data for manufacturing industries have been compiled from the Enterprise Survey on the assumption that the manufacturing sector has the same employment structure as that estimated from the Enterprise Survey. This procedure could lead to an underestimation of the employment effect because the survey data covers mostly large and medium-sized firms. With these caveats, there is no a priori reason to doubt the assumptions on which these calculations are based.

Results

Table 6 illustrates how the structure of employment has been affected by manufacturing exports. The composition of employment created by manufacturing exports was quite similar in 2000 and 2007. In 2000, about 64 per cent of the total employment generated by manufacturing exports was in the agriculture sector. This confirms that a strong linkage exists between processed food exports and the agricultural sector. This is because most of this industry's

[11] GSO provided a 112-sector classification in the I-O table for in 2000 and 136-sector classification in 2007.

raw materials come from agriculture. As expected, manufacturing employment was also greatly affected by the exports from this sector. Within the industrial sector, the job- created effect of manufacturing exports on two other sub-industries (mining and construction) was almost negligible – the effect on the construction sector runs counter to the normal expectation that links with manufacturing would be stronger in this sector.[12] Furthermore, a modest proportion of jobs created by manufacturing exports was found in the services sector in 2000.

Table 6: Sectoral composition of employment created by manufacturing exports, Vietnam 2000 and 2007

Sectors	**2000**		**2007**	
	Number ('000)	Percentage (%)	Number ('000)	Percentage (%)
Agriculture	3,764	*64.0*	6,488	*50.4*
Mining and quarrying	6	*0.1*	47	*0.4*
Manufacturing	1,595	*27.1*	3,861	*30.0*
Construction and public utilities	30	*0.5*	834	*6.5*
Services	488	*8.3*	1634	*12.7*
All sectors	5,884	*100*	12,863	*100*

Source: Calculated from the I-O tables, 2000 and 2007

Although most of the employment created by manufacturing exports in 2007 was still concentrated in agriculture (reflecting the continuing importance of processed foods in the export composition), the agricultural share in total export-induced employment fell to a half. This partly reflects the shrinking share of the processed food category in total manufacturing exports. However, manufacturing exports were far more significant in creating employment in non-agricultural sectors. A sharp increase in export-related jobs was apparent in other sectors, in particular in construction[13] and services,

[12] The minor effect on the construction sector may be due to the poor data quality provided in the I-O table in 2000.

[13] There appears to be a significant improvement in the quality of data in the 2007 I-O table, compared with the previous table. Hence, it reflects the expected effect of manufactured exports on the construction sector.

as well as in manufacturing. This demonstrates the remarkable structural change in employment patterns that resulted from the expansion of manufacturing exports, especially those that involve more labour-intensive products.

Table 7 shows the contribution of manufacturing exports to employment creation. Total employment generated by manufacturing exports shows a more than two-fold increase, from 5.8 million in 2000 to 12.9 million in 2007. Manufacturing exports contributed almost 30 per cent of total employment in 2007, up from about 16 per cent in 2000. This share is comparable with that in Taiwan and South Korea during their early stages of industrialization (Kuo 1983). As expected, manufacturing exports were the most significant source of manufacturing employment in Vietnam. In particular, within manufacturing the number of jobs created through exports increased from about 1.6 million in 2000 (about a half of total manufacturing employment) to 3.8 million (nearly 70 per cent of the total) in 2007.

Table 7: Contribution of manufacturing exports to employment creation, Vietnam 2000 and 2007

Sectors	**2000**			**2007**		
	Total*	**Export-related**		**Total***	**Export-related**	
		Number ('000)	% of all jobs (%)		Number ('000)	% of all jobs (%)
	(1)	(2)	(2)/(1)	(1')	(2')	(2')/(1')
Agriculture	25,045	3,764	15.0	24,368	6,488	26.6
Mining and quarrying	219	6	2.7	299	47	15.7
Manufacturing	3,208	1,595	49.7	5,741	3,861	67.2
Construction and public utilities	1,018	30	3.0	2,534	834	32.9
Services	7,212	488	6.8	12,266	1,634	13.3
All sectors	36,702	5,884	16.0	45,208	12,863	28.5

Note: * Total employment for the whole economy

Source: Computed from the I-O tables, 2000 and 2007

5. Conclusions

This paper explores the impact of manufacturing exports on job creation in the Vietnamese economy. The results show the significance of manufacturing export expansion for employment generation in Vietnam. I determine that over the period 2000-11, exports from Vietnam grew rapidly, with a palpable compositional shift in commodity composition toward manufacturing exports. Among the various sub-groups in manufacturing exports, the relative importance of traditional labour-intensive goods, electronics products and processed goods increased over time. Undoubtedly, the most impressive contribution of export-oriented industrialization has been the significant change in employment patterns over the first decade of the 2000s. This shift has involved the movement of unskilled workers into the higher-productivity industrial sector, and, in particular, into manufacturing.

My analysis reveals that manufacturing exports had a significant impact on sectoral employment patterns between 2000 and 2007. Through the direct effect of export expansion, and the accompanying spillover effects across sectors within the economy, about 7 million new jobs were created. In particular, over half of the total jobs created by manufacturing exports were in the agriculture sector. At the end of the period examined, the majority of employment in manufacturing relied mainly on an expansion of manufacturing exports. Overall, the employment effect of the export-oriented industrialization in Vietnam is consistent with the experience of other East Asian economies.

The promotion of manufacturing exports is likely to be the best strategy for achieving an objective of job creation in Vietnamese economy. Manufacturing exports can generate employment not only within the manufacturing sector but also in the overall economy through the spillover effect. In promoting such exports, Vietnam needs to draw on its current comparative advantages – such as labour abundance in a pursuit of economic development.

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