



Australian
National
University

Working Papers in Trade and Development

Exports and Job Creation in Indonesia Before and After the Asian Financial Crisis

Haryo Aswicahyono
and
Chris Manning

August 2011
Working Paper No. 2011/11

Arndt-Corden Department of Economics
Crawford School of Economics and Government
ANU College of Asia and the Pacific

Exports and Job Creation in Indonesia Before and After the Asian Financial Crisis

Haryo Aswicahyono
Centre for Strategic and International Studies
Jakarta

And

Chris Manning
The Arndt-Corden Department of Economics
Crawford School of Economics and Government
ANU College of Asia and the Pacific
The Australian National University

Corresponding Address :

Chris Manning
The Arndt-Corden Department of Economics
Crawford School of Economics and Government
ANU College of Asia and the Pacific
Coombs Building 9
The Australian National University
Canberra ACT 0200

Email: Chris.Manning@anu.edu.au

August 2011
Working Paper No. 2011/11

This Working Paper series provides a vehicle for preliminary circulation of research results in the fields of economic development and international trade. The series is intended to stimulate discussion and critical comment. Staff and visitors in any part of the Australian National University are encouraged to contribute. To facilitate prompt distribution, papers are screened, but not formally refereed.

Copies may be obtained at WWW Site
<http://www.crawford.anu.edu.au/acde/publications/>

Exports and Job Creation in Indonesia Before and After the Asian Financial Crisis

Haryo Aswicahyono and Chris Manning

Abstract: Employment generation has been a challenge in Indonesia since the Asian Financial Crisis (AFC), especially in labor-intensive manufacturing. We examine the direct and indirect impact of exports on jobs, based on an analysis of input-output tables over the period 1985-2005, and compare these findings with the earlier pre-crisis period. The paper finds that fewer jobs were created through exports in manufacturing industries in after the AFC, because of slower growth in manufacturing exports and a shift away from light industry. However, there was an increase in service sector jobs, partly because of linkages with the main export industries in manufacturing and primary industry. Besides intensified competition from other lower-middle income Asian economies, the main constraints to job creation through exports appear to have been on the supply side; these include too poor infrastructure, an uncertain investment climate and tight labor regulations.

Key words: exports, employment creation, manufacturing growth, input-output analysis, Indonesia, Southeast Asia

JEL Classification: F16, J23, O14

Exports and Job Creation in Indonesia Before and After the Asian Financial Crisis

Haryo Aswicahyono and Chris Manning¹

1. INTRODUCTION

Manufacturing exports have been a driving force behind employment growth and improved living standards of many East Asian countries for over practically half a century from the 1960s. The well known mechanism was through the transfer of low productivity labor out of agriculture and the informal sector into better paying, wage jobs in the growing industrial sector (Ranis, 2004).

That nexus which linked manufacturing expansion and strong export growth to play the dominant role in job creation in early stages of development appears to have been broken in several countries since the Asian Financial Crisis in 1997-98. Manufacturing output and employment slowed appreciably in several countries (Aswicahyono et al., 2011). However, there is little information available which directly links export performance to employment. This paper examines these shifts in Indonesia, one of the export-oriented success stories in manufacturing in East Asia before the Asian Financial Crisis (AFC).

Employment generation was a major challenge for Indonesia in the decade after the AFC (World Bank, 2010). The growth of jobs in manufacturing growth was miniscule. The contrast

¹ Centre for Strategic and International Studies, Jakarta and the Australian National University respectively. An earlier version of the paper was presented at a seminar in the Arndt-Corden Department of Economics in the Crawford School, Australian National University, August 9, 2011. The authors wish to thank participants at that seminar for their comments and Prema-chandra Athukorala, Hal Hill and Thee Kian Wie for insightful comments on an earlier draft of the paper. The normal disclaimers apply. An earlier draft of this paper co-authored with Douglas Brooks entitled 'Exports and Employment in Indonesia: the Demise of Labor-Intensive Manufacturing and the Rise of Services' was presented at the International Collaborative Initiative on Trade and Employment (ICITE) Conference on *Labor, Trade and Inclusive Growth: Sustaining a Dynamic Asia*, Asian Development Bank, Manila, April 18-19 2011. The authors wish to thank the ADB and Douglas Brooks in particular for support for the research.

was marked compared with the previous decade. Fewer people moved out of agriculture and it was left to services to pick up the slack created by the slowdown of manufacturing.

While some of these problems are well documented in recent research, less is known about the role which slower export growth and the changing composition of exports contributed to diminished job creation in manufacturing.² This is the main focus of the paper, which contrasts developments after the AFC with those observed before the crisis.³ In addition, it examines indirect effects – linkages between manufacturing exports and employment in other sectors – as well as the growing role of services in producing jobs. The paper places these developments in the context of labor market developments in Indonesia in the decade spanning the AFC.

The paper is based on Indonesia's input-output tables that have been constructed each five years since the mid 1970s, and allow us to draw direct links between output, sources of demand growth and employment. The input-output data used allow us to examine the impact of exports on employment through to 2005. The main contributions are to extend the earlier analysis to the post-crisis period and contrast developments with those before the AFC. We also provide much more detailed information than earlier studies on the activities that have grown and those that have declined over this period, both in manufacturing and more broadly, and to set these developments in the changing international and national growth and policy context after the AFC. The information on the role of linkages in job creation, and service sector employment are also new in the Indonesian context. Finally, we suggest several factors that may have influenced the adjustments to the structure of employment in relation to exports, which are fitting for further study, although the paper does not attempt to explain the changes observed quantitatively.

² Unless otherwise specified, the 'crisis' mentioned in this paper refers to the Asian Financial Crisis of 1997-98, not the Global Financial Crisis of 2008-09.

³ The relationship between exports and employment was addressed in several earlier papers that estimated employment generated by manufacturing exports in the later Soeharto years. See especially Fujita and James (1997), Athukorala and Santosa (1997) and James and Fujita (2000).

The paper is divided into four sections. The section looks at Indonesian growth, export and employment growth in comparative perspective before and after the AFC. This sets the stage for the main empirical analysis of export-employment linkages in the decades before and after the AFC in the third section of the paper. In the final section, we conclude and suggest some the implications of the empirical findings for policy.

2. THE NATIONAL AND INTERNATIONAL CONTEXT

In the first two decades of the Soeharto government (1966-1986), policy to support job creation was heavily focused on restoring macroeconomic stability and promoting sectors oriented to the domestic market. The emphasis was on food production, and import substitution in manufacturing (Hill, 2000). For the most part, this was set in motion by a combination economic reforms, supported by the windfall gains to the budget from the sharp increase in the prices of oil exports in the 1970s. The oil boom financed raw material and capital goods imports, improvements in infrastructure and social capital, which in turn enticed new investment and drove improvements in productivity and expansion of employment.

A tipping point was reached in the mid 1980s, however. Indonesia had reached limits to manufacturing growth based on import substitution policies, and public investment was hurt by a large decline in the world oil price. A new approach was needed if the economy was to continue to grow rapidly. The government responded with a more liberal trade policy and foreign investment laws. As a result, effective protection of non-oil manufacturing fell from 80 percent in 1987 to 35 percent in 1990 and 25 percent in 1995, and many non-tariff barriers to trade were removed (Fane and Conden, 1996).

The speed and extent of the response to the reforms took many observers by surprise, for a country that had long experienced import substitution industrialization. In the decade prior to the Asian Financial Crisis, Indonesia made an unexpected shift away from reliance on primary product exports towards export-oriented manufacturing. In their analysis of employment

trends Fujita and James (1997: 114) referred to Indonesia's a "remarkable structural adjustment" since trade and industrial policy liberalization occurred in the mid 1980s." They showed that growth of manufactured exports, particularly in more labor-intensive, light industries, were the driving force behind employment gains at this time.⁴ In this, Indonesia followed in the footsteps of the NIEs and several Southeast Asian countries such as Malaysia and Thailand. There were some signs of widespread improvements in earnings and productivity, although still smaller than those that had driven substantial advances in living standards in these neighboring countries (Manning, 1998). Several authors also drew attention to the positive stimulus which trade and investment reforms had on manufacturing exports and employment.⁵

During and immediately after the AFC, this momentum was initially sustained by the substantial incentives to export implicit in the subsequent large depreciation of the rupiah that had occurred during the crisis (Soesastro and Basri, 1998). We take up the story from around this point. The paper looks at experience in exports and their impact on employment focusing on manufacturing in two periods 1985-1995 and 1995-2005, for which input-output data are available. In this it builds on the estimates made by James and Fujita (2000) and Athukorala and Santosa (1997) for the 1980s through to the mid 1990s.

Compared with the earlier Soeharto period, economic performance faltered after the AFC.⁶ After enjoying several decades of steady growth averaging close to seven percent per annum, growth did not did not top five percent until 2005. This fall in economic growth rates was experienced by several other (albeit better-of) countries in the region, such as Malaysia and Thailand, both of which also suffered a major setback during the AFC and then recovered

⁴ However Fujita and James also cautioned that premature rises in minimum wages above market rates may "undermine" this important development for a sustained improvement in employment and wages.

⁵ See especially Fujita and James (1997), Athukorala and Santosa (1997) and Manning and Posso (2010). However, the momentum for restructuring slackened after the main trade and investment reforms were introduced in 1986-1991 (James and Fujita, 2000).

⁶ Nevertheless, controlling for political transition, Pritchett (2011) demonstrates that growth has been quite respectable, for a country experiencing a major transition to democracy.

slowly subsequently (Figure 1). But it has been close to half the growth in other countries, especially China and Vietnam in East Asia.

Figure 1 about here

The contrast is even greater for exports that drove economic growth in other countries in East Asia prior to the AFC (see Figure 1). After plummeting during the AFC, exports had only partially recovered by 2008 on the eve of the global financial crisis, although they had done better relatively in Indonesia than in Thailand and Malaysia in the 2000s compared with the 1990s.

Second, industrial sector growth rates were much slower relative to those in other sectors. This sector had grown very strongly and absorbed a significant share of new job entrants and low productivity workers from agriculture in the Soeharto era. In the post-crisis period, non-agricultural growth was now held up by services rather than manufacturing, as shown in the comparison of sectoral growth rates (Figure 2). The relative collapse of manufacturing compared with services was greater in Indonesia than in the two other Southeast Asian countries most affected by the crisis, Malaysia and Thailand.

Looking at the main industrial categories identified in the input-output tables for the period 1985-2005, including the three main manufacturing groups (food processing, light industry and heavy industries and chemicals), slower growth is apparent in all industries after the crisis (Table 1). In manufacturing, the relative decline in the share of output from food processing and light industry after the AFC stands out, in contrast to their strong growth in the decade from the mid 1980s. Output in heavy and chemical industries grew slightly faster, though by no means remarkably compared with before the AFC, and their share of output rose quite steeply.

Figure 2 and Table 1 about here

The Labor Market Context

What about trends in employment? Table 1 indicates a sharp break with the pre-crisis period for all sectors, as might be expected from the data on output. The outcome for employment was even worse than output. Employment hardly grew at all after 1995 through to the middle of the next decade. It was only significantly different from zero in heavy industry and chemicals. As noted, similar trends were apparent elsewhere in Southeast Asia. Aswicahyono et al. (2011: Table 6.2) show that the fall in manufacturing output impacted negatively on employment in selected East Asian countries in the period after the crisis. Employment elasticities with respect to output also declined significantly.⁷

The employment record in manufacturing and in relation to exports needs to be set in the context of the overall structure of the labor force, employment and wages. On the eve of the crisis, the Indonesian labor market was still very much in transition, from a low productivity, rural economy with an elastic supply of unskilled workers, to one in which higher output per worker in industry and modern services began to play a more important role (Manning, 1998; World Bank, 2010).

During the early period after the AFC the record of formal sector employment was especially poor. The index of employment in regular wage jobs declined through to the middle of the decade, in contrast to casual wage and informal sector jobs where it rose.⁸ Unemployment increased from around 8 per cent in 2001 to 11 per cent in 2005. The movement of workers out of low-productivity agriculture stalled, and the informal sector (including casual wage employees) absorbed most of the increase in employment. Real wages also stagnated through to the middle of the 2000s, both for females as well as males (World Bank, 2010).

⁷ Aswicahyono et al. find that not only in Indonesia but also in Malaysia, Thailand and South Korea, the growth in employment fell from around six percent per annum before the crisis to record negative figures or very slow growth of around 1-2 percent. In the case of Indonesia, manufacturing employment grew by just under one percent.

⁸ These observations on employment and wage trends are based on analysis of data from the National Labor Force. Labor market conditions improved somewhat in the second half of the 2000s (see Manning, 2011; see also World Bank, 2010.). Just over 40 percent of all employment is in agriculture and 60 percent of all non-agricultural employment were in the informal sector in mid 2000s (World Bank, 2010).

Coincident with these developments, the modern sector of the Indonesian labor market became much more regulated. Post Soeharto governments totally revamped the regulatory framework governing conditions of work, social protection and industrial relations for regular wage employees (Manning and Roesad, 2007). Besides mandating a national system of minimum wages, rates of severance rose to high levels by international standards in the early post-crisis years (2000-3), as result of both significant increases in legal rates as well as in minimum wages on which they were based. The Manpower Law of 2003 also placed tight restrictions on fixed term contracts and outsourcing. Fixed term contracts were in duration (a maximum of two years plus a one-year extension), while sub-contracting or outsourcing was only permitted for the enterprise's 'non-core' activities. As with severance pay regulations, tighter regulation of non-regular work went against international trends, especially in Latin America, which had tended to move in the direction of improving labor market flexibility from the 1990s (IADB, 2004).

It is the combination of slower rates of economic growth, difficult labor market conditions and tight labor regulations that provides the context for the discussion of export performance and employment. We now turn to this subject.

4. EXPORTS AND EMPLOYMENT

This section examines which export sectors and commodities have grown rapidly and which ones have slowed down, and what has been their impact on employment in the period immediately after the AFC.

Why this interest in the relationship between exports and employment? As alluded to in the introduction, the rapid growth of output exports, and the import of raw materials, capital goods and embodied technology, triggered a transformation of labor markets in a large number of countries in East Asia over several decades. Following the experience of Japan, manufacturing exports, initially labor-intensive and later more capital and skill intensive,

drove growth in jobs and labor market transformation. This proceeded first among the four North East Asian Tigers in the 1960s and 1970s, then later in several Southeast Asia countries including Indonesia, and most recently in China and Vietnam from the 1990s.⁹ In contrast to the situation in post-AFC Indonesia, however a feature of the link between exports and employment in most of these economies has been a relatively unregulated labor market, and limited opportunities ('space') for trade unions to bargain up the price of labor in the early stages of development.

What has been the experience of Indonesia, especially in the post-AFC period? We start the discussion by looking at the structure of exports by groups of products and services, and then turn to their employment effects.

Methodology

The analysis focuses on a comparison of trends for two periods: prior to the crisis 1985-1995, and the period spanning the crisis and post-crisis years (1995-2005). The latter period covers both the period of crisis and recovery through to 2000, and a period of more normal growth in 2000-2005.¹⁰ The input output tables for Indonesia are computed every five years and published with a considerable lag. The following analysis is based on the tables computed in every five years beginning in 1985 (eg., 1985, 1990, 1995, 2000, 2005). One valuable feature of the Indonesian tables is that industry breakdown of employment data collected in the National Labour Force Surveys are computed to match the industry breakdown for sales/receipts and payments in the I-O tables. This makes it possible to calculate employment coefficients and analyse employment trends in relation to final demand categories, including exports.¹¹

For our purposes, following the work of James and Fujita (2000), exports are classified into five major sectors based on the 66 sector classification in the Indonesian input-output tables:

⁹ See especially Fields (1994), World Bank (1993) and Manning and Posso (2010). In more recent times, China is the classic example. It is argued that the growth in manufacturing exports had a major impact on the country's capacity to move towards a 'turning point' in labor markets in the 2000s (Garnaut, 2010).

¹⁰ Data are not yet available from the 2010 input-output tables.

¹¹ The analysis of the I-O tables utilizes 'complementary import tables' to take account of the fact that imports have no linkages to employment in the local economy.

primary sectors (including oil and gas, and agriculture), food processing, light industry, heavy industry and services.¹²

In the framework of the input-output (I-O) model, the following balance equation can be derived¹³:

$$X = A^d X + F^d + E \quad (1)$$

where X denotes an output vector, A^d a domestic input coefficient matrix, F^d a domestic final demand vector, and E a vector of exports. Then, assuming X is an endogenous variable, the following solution is derived:

$$X = R^d (F^d + E) \quad (2)$$

where $R^d = (1 - A^d)^{-1}$ is a domestic Leontief inverse matrix.

This method allows us to take into account variations in the import content of intermediate and final demand.¹⁴

A vector of employment is decomposed as follows:

$$W = LX = L R^d F^d + L R^d E \quad (3)$$

where W is a vector of employment and L is a diagonal matrix of employment coefficients. The second term on the right side of (3) captures the effects on employment of exports. Therefore, the employment created by manufactured exports, W_m^e , is:

$$W_m^e = L R^d E_m \quad (4)$$

where $E_m = (0, \dots, 0, e_1, \dots, e_n, 0, \dots, 0)'$ denotes a vector of manufactured exports

The Changing Export Structure

As noted above, after recovery from the crisis, annual growth rates in the value exports (close to eight percent per annum) were nearly twice as high as output in the post-AFC period,

¹² We extend the James and Fujita estimates on the employment impact of exports in each of the five sectors to the period 2000-2005. For comparability, we retain their classification of industries, although one might question equating their category of 'light industry' with labor-intensive industries for some industries such as paper and spinning.

¹³ For a full account see Bulmer-Thomas (1982), and Thirwell (2003: Chapter 13) for a summary exposition.

¹⁴ For example, it is expected that exports of light industries use a higher proportion of imported intermediate inputs than do manufactured goods for the domestic market, particularly after 1985, when a duty drawback (exemption) scheme was adopted for exporters (James and Fujita, 1997).

although they were lower than double digit figures recorded for exports in the decade before the crisis. This is reflected in growth figures for all exports in all sectors.

In addition to the slowdown in exports after the AFC, there has been a big change in the composition of exports.¹⁵ Three key changes stand out, as shown by the data on export trends (Table 2). First, the pronounced shift towards manufacturing exports, and especially light industry, in the pre-AFC period 1985-1995 did not last after the crisis and recovery period. High growth rates (8-9 percent) from 1995 in three industry groups: primary sectors, food processing and heavy manufacturing/chemicals, contrast with much lower growth in services and light manufacturing. The manufacturing share of exports fell back to 40 percent of all exports by 2005. It had risen from a 15 percent share to account for half of all exports in the decade before the crisis.

Table 2 about here

This fall in share of manufacturing was largely due to the disappointing export performance of light manufacturing industries. A large share of manufacturing exports now consisted of capital-intensive and chemical products rather than light industry. Machinery and electrical goods accounted for almost one quarter of total exports in 2005, now eclipsing the previously dominant TCF industries.¹⁶

It is noteworthy that the slow-down in light industry exports was particularly marked **after** recovery from the AFC in 2000-2005, when exports hardly grew at all. This was a period of some political instability and when the newly established governments brought in a raft of new regulations. As noted in the previous section, these included extensive labor regulations and big increases in minimum wages in 2000-2002, as well as radical steps towards fiscal decentralization.

Second, after declining precipitously in the period 1985-95, the share of primary exports

¹⁵ Growth rates are based on current US\$, which rose slightly faster than at constant prices.

¹⁶ In reality, electrical goods and machinery also include a significant share of labor-intensive products. However the I-O tables do not permit a more detailed breakdown to identify these activities separately.

rebounded from 1995 to just under one third of the total by 2005.¹⁷ This time, the surge was led by coal and other mineral exports, in addition to petroleum and natural gas which had driven growth in earlier decades. To some extent, the trend from 2000 was again towards greater dependence on natural resources; however, for these products the direct impact on employment was likely to be small.¹⁸ Rising commodity prices also played a role, especially in the stimulus given to oil palm, vegetable oils and fats and other processed foods. Related to these changes, processed food exports also grew strongly from a low base after the crisis (at an annual growth rate of 15 percent in 2000-05). This rapid growth was largely due to the rapid expansion in processed oils, mostly palm oil which accounted for over half this category in 2005.

Third, the value of service activities also grew strongly. Among the service categories, trade was by far the largest contributor, followed by restaurants and hotels, the latter presumably closely associated with the tourist industry centered on Bali. As we shall see, employment effects in services were substantial.

Exports and Employment

How has this changing structure of exports affected employment? We address three issues: the overall impact of exports and exports in major sectors on employment and how this has changed over time; indirect employment effects of exports through linkages with other sectors; and, third, the changing elasticity of exports with regard to employment.

First we show the impact of exports on total employment before and after the AFC (Table 3). According to these calculations, employment in export activities reached a peak at just below 18 million in 2000. This amounted to just under 20 percent of the total employment, at a time when incentives for exporting were at an all time high, associated with the large exchange rate

¹⁷ The share of primary products in total exports declined steeply from 72 percent in 1985 to only one quarter of total exports a decade later.

¹⁸ Within the primary sector, the share of 'traditional' agricultural commodity exports (rubber, coffee, and tea), and estate products remained small, as did timber and fisheries exports: in total, these two groups together barely recorded more than five percent of total exports in 2005.

depreciation that occurred in Indonesia during the AFC.¹⁹ Note that the estimated contribution of exports to total employment declined quite markedly subsequently to only 17 percent in 2005, partly as a result of a slow-down in export growth, and partly related to a change in the composition of exports away from light industry.

The data presented in Table 3 also show that employment induced per the unit value of exports declined significantly in the first half of the 2000s. It was similar in 2000 to that achieved during the height of the manufacturing export boom in 1990 (not shown in the table), but per \$US 1 million value of exports declined sharply after that, from around 260 in 2000 to 160 persons in 2005.

Turning to the distribution of employment induced by exports, it is noteworthy that nearly half of all jobs were created in services throughout the period examined, both before and after the crisis, many of them through linkages with tradable sectors (see below for further discussion). At the same time, the changing pattern of exports in tradable goods, is reflected in quite big shifts in the patterns of employment in relation to exports. Whereas in the period 1985-1995 nearly one-third of jobs were created in light manufacturing, in the following decade a similar proportion were provided in primary industry. In the former period, TCF and wood industries accounted for a high percentage of all jobs created; in the latter, it was oil palm (in the category coconut and palm oil) and vegetables and fruits.²⁰

Two other patterns are worth noting. As might be expected, there were significant differences in the contribution of each sector to employment, compared with their percentage share of the value of exports (Table 4). For example, a high proportion of jobs related to exports occurred in services, and stands in contrast to the modest contribution of services to the value of exports (see Table 2 above). The high employment elasticity of exports in services appears to have been

¹⁹ The real effective exchange rate had halved by mid 1998, compared with the level recorded in the third quarter of 1997 and till 2001 remained well below the level recorded in the preceding seven years. In 2001 the nominal and real exchanges rates began to improve significantly. See IMF, International Financial Statistics, various year.

²⁰ See Annex Table 1 for details of employment created in the 66 activities distinguished in the I-O tables.

related to the creation of many jobs in small scale trading and service activities, induced by exports in tradable sectors, as well as services associated with tourism.²¹ The percentage of jobs created was also higher in light industry than their share of the value of exports, reflecting more jobs created per unit value of exports.

Tables 3 and 4 about here

In contrast to primary industries and light manufacturing, the two other manufacturing sectors, food processing and heavy and chemical industries (H&C industries) accounted for a small share of employment growth in export industries, even though they grew quite strongly. In both these industries, exports were more capital- or technology-intensive than in other sectors. For example, the H&C industries and food processing only created 30-40 jobs per US\$ 1 million of exports in 2005, around one-tenth of the number of jobs per unit value of exports in light manufacturing and services (341 jobs per US\$ 1 million of exports in 2005).²² While the share of the value of H&C exports tripled, from 8 to 24 percent from 1985-05, the share of jobs created in these export sectors only rose marginally from four to five percent.

Second, there were significant shifts in the distribution of jobs across exporting sectors pre and post-AFC (see the last two columns of Table 4). The very significant decline in the light industry share of the total is apparent in the post-AFC period. Whereas these industries had accounted for almost one-third of all new jobs created by export industries before the crisis, this share fell to less than 20% in the subsequent decade.

²¹ Five service activities related to exports were among the ten largest employers of labor. By far the largest was trade (over three million jobs in 2005), followed by road transport (associated with commodity exports) and 'culture and amusement' (especially related to tourism). Smaller but still creating over 300,000 jobs were water transport and restaurants and hotels.

²² In food processing, the share of jobs actually declined after the crisis, despite a significant rise in export values. Most of the new jobs were in relatively capital-intensive palm oil processing plants. However, as shown below, food processing industries had strong linkages in terms of employment with primary sectors for commodities such as oil palm and coffee.

Overall, the share of **all jobs** created by exports rose quite significantly from around the mid 1980s. Table 5 shows the contribution of exports to total employment in Indonesia over the period 1985-2005. Export activities accounted for less than 10 per cent of all jobs in 1985 but their share of all **new** jobs created was 27 and 67 percent in the period 1985-95 and 1995-2005 respectively (see the last three columns in Table 5). Thus although exports slowed in the post-crisis period, these sectors still played a crucial role in job creation. As we noted in the second section, unemployment rose in Indonesia in the period after the AFC. It surely would have risen much more if exports had not supported over two thirds of all jobs created in this period, both directly and indirectly (see below).

Manufacturing

Focusing on manufacturing, we discuss how much employment was created in various sub-sectors and speculate on the likely determinants of these patterns and trends. Table 6 shows the growth of manufacturing output and share of employment in the main industries in the sector, distinguishing between the main light industry and heavy and chemical industries.

Tables 5 and 6 about here

Two main patterns are apparent. First, the slowdown in light industry job creation was experienced across the board except for paper and printing. In part, this was a consequence of slower growth.²³ Exports in textiles, clothing and footwear (TCF) hardly grew, and they declined in the wood based industries (including furniture) from 1995-2005.²⁴ Nevertheless, employment growth was still significant in both these industries, suggesting that some labor-intensive segments were still able to compete in world markets. For example, even though TCF and wood industries contributed less than five percent of the increase in the value of manufacturing exports in the post-crisis period, they provided 40 percent of all jobs associated

²³ Paper manufacture is quite capital-intensive but could not be separated out from much more labor-intensive printing activities.

²⁴ The value of exports continued to rise slowly in the TCF industries in 2000-2005, while they fell in the wood based industries.

with exports in this period. These figures once again highlight the importance of labor-intensive activities for total employment in labor abundant countries like Indonesia.

Second, the potential for job creation in leading export sectors after the AFC was limited. Many of these were in the H&C industries. Among major sectors, employment generated by exports in machinery and electrical products and non-metallic minerals grew quite strongly, but from a low base. These increases were counterbalanced by much slower growth in employment in rubber products and chemicals, despite quite impressive growth in the value of exports in these two sectors.²⁵

Linkages

One issue frequently raised in the literature is the extent to which productive sectors have linkages with other sectors. Government interventions are sometimes justified on the basis of the extent of these linkages, especially to help overcome pressing problems of unemployment.²⁶ They consist of either backward linkages, inducing purchases of goods and services, or forward linkages as a result of sales to other sectors.

Although not distinguishing between forward and backward linkages, Table 7 provides some information on the extent to which exports from major sectors were estimated to create employment in other sectors. The pattern did not change much after the crisis, despite the changes in the structure of exports. The data suggest three interesting patterns. As noted above, in contrast to the modest contribution of services to the value of exports, a high proportion of jobs associated with exports in **all** the tradable sectors were created through linkages with service activities. Around 15-20 percent of jobs associated with exports in primary industry, food processing and light industry were generated in services in both 1995

²⁵ One caveat needs to be added. In line with international patterns, we can expect the skill composition of jobs to be significantly higher in the H&C industries than in light industry. Thus, the contribution to overcoming unemployment of skilled workers and to human capital formation is likely to be greater.

²⁶ The idea was popularized in the development literature through the work of Hirshman (1958) more than half a century ago. It gained some currency in Indonesia (and still remains a popular idea in policy circles) through research undertaken by Lal and Rao (1995) on industrial upgrading. See Athukorala and Santosa (1997) for a critical review.

and a decade later in 2005. In the case of H&C industries the figure was 40 percent. Some of these service sector jobs were the result of forward linkages in road transport and shipping (around 20%). But the large majority were related to domestic trade activities, probably in both producer goods as well as through consumption activities of workers employed in these industries.

Second, exports from all sectors created significant linkages with primary industry. This was particularly true of food processing, for obvious reasons. Here around one third were in oil palm, and a further 10 percent in coconuts and maize. But 10-20 percent of all jobs associated with exports from light and heavy industry were also in primary industries, which supplied a range of inputs, including fuel (such as refined petroleum and coal) to manufacturing firms.

Finally, among the manufacturing sectors, light industry had the smallest linkages in terms of employment with other sectors. But light industry had by far the largest overall employment impact, even after the AFC when exports from this sector had plateaued. The contrast with the second largest manufacturing group, H&C industries, is obvious (Figure 5). Even though the share of jobs generated indirectly was much larger in H&C, total employment created was two times higher in light industry, as a result of stronger direct employment effects. The difference between light industry and food processing in this regard was even starker.

Table 7 and Figure 5 about here

4. CONCLUDING REMARKS AND SOME POLICY IMPLICATIONS

This paper has drawn on the Indonesian input-output tables to study the relationship between exports and employment. It is set in the context of the general slowdown in manufacturing employment in Indonesia after the AFC, which has been attributed to both slower overall industrial growth and smaller employment elasticities with respect to output. Employment

has become less responsive to output growth within sectors in recent years (Aswicahyono et al., 2011).

The data suggest that one factor behind Indonesia's poor employment record in manufacturing in the period after the Asian Financial Crisis has been fewer jobs created in export oriented industries than before the crisis. At the same time, exports accounted for many more jobs than domestic demand growth in the post-crisis period. Without a growing export sector, it is likely that the employment situation, which had deteriorated after the crisis, may have been much worse.

The slowdown in employment was a consequence of three sets of factors: the slower growth of manufacturing exports compared with before the AFC; the change in composition of exports away from light industry and towards more capital and resource intensive food processing, heavy industry and chemicals; and lower employment elasticities with respect to output in several sectors.

The analysis of I-O data also suggests that food processing and H&C industries created few jobs directly, despite impressive growth. However, these industries generated more jobs through linkages with primary industry and services. The analysis confirms that indirect employment through jobs created in service industries, especially trade and transport, has also been important in terms of new jobs created.

Nevertheless, the share of jobs created through the linkages between manufacturing, in particular, and other sectors has been small (around 20 percent of all jobs created through exports in 2005, and most of these in primary industry). It was much smaller than direct job creation in light industry, even after this sector had slowed significantly from around 2000. Thus our findings confirm the conclusion by Athukorala and Santosa (1997:) that one should be wary of using linkages as a criterion for assessing manufacturing export performance, especially in regard to the labour market. They counsel that export-oriented sectors

“..characterized by high import intensity and hence low domestic input linkages have the potential to make a greater contribution to employment expansion and the growth of export earnings.” This was certainly the case for light industry exports in Indonesia during the time period examined in this paper.

The number of jobs created per unit of export has also declined over time, implying low elasticities of employment with respect to exports. In the post-crisis period through to 2005, this was mainly the result of a compositional shift in exports away from light industry. From the standpoint of a balanced industrial and labor market transition (Ranis, 2004), one might argue that this compositional change towards more resource and capital-intensive products, as well as industrial upgrading within industries, is likely to be premature from the standpoint of job creation in Indonesia. It can be argued that these changes in the structure of exports and jobs created in major exporting activities have taken place in the context of a relatively elastic supply of unskilled labor in Indonesia. This is evidenced by a large share of the work force concentrated in low productivity agriculture and the informal sector, high rates of unemployment and under-employment, and relative stagnation of real wage rates in the decade of the 2000s. This contrasts with similar transitions in other East Asian economies, where technological upgrading has frequently been in response to shortages of unskilled labor.

While explanations for these trends are beyond the scope of this paper, we can speculate as to why export sectors, especially light industry, have grown slowly and created fewer jobs in the post crisis period in Indonesia. It has been pointed out that ‘jobless growth’ in manufacturing is not a uniquely Indonesian problem in the post-AFC period (Aswicahyono et al., 2011). In particular, competitive pressures from China have resulted in the shift of manufacturing exports away from previously successful exporting countries, such as Thailand, Malaysia and Indonesia (Athukorala, 2006a).

Nevertheless, it can be argued that the Indonesian case appears distinctive in several respects, which might help explain the intensity of the export reversal. They include greater regulatory

and policy uncertainty for investors following regime change and decentralization, markedly increased infrastructure bottlenecks after the AFC, and greater labor market regulation. All of these factors are likely to have been especially important for exports of light industry products such as textiles, clothing and footwear, as well as labor-intensive electronics and assembly activities.

Athukorala (2006b), for example, argues that uncertain the investment climate and infrastructure bottlenecks have almost certainly contributed to Indonesia's very limited role in the global production networks in electronics and automotive industries, the most rapidly growing sectors in manufacturing in East Asia since the AFC. This has meant missing out in connecting to this important dimension of the China locomotive, which has driven much of East Asian trade in countries like Vietnam, Thailand and Malaysia (Athukorala, 2006a, 2009).²⁷

Some authors have highlighted the impact of introduction of more restrictive labor regulations on employment in Indonesia. This occurred precisely at the time of greater economic uncertainty after the AFC and regime change in Indonesia. Although studies show that the effects of minimum wages have been variable in Indonesia,²⁸ it seems likely that labor regulations have had a greater impact on employment in light industry, and the TCF industries in particular, that tend to employ larger numbers of relatively unskilled, migrant and female workers (Carraway, 2004). Such firms are particularly vulnerable to labor protests, and are more exposed to monitoring of regulations by the authorities.

In these labor-intensive sectors, international competitiveness is particularly dependent on the flexible deployment of unskilled labor. Reduced employment in labor-intensive exports could thus be partly the result of rising labor costs, related to greater regulation. This is in contrast to

²⁷ Vietnam is an outstanding example of a country where the link between very rapid export expansion, economic growth and employment has been especially strong, led by labor-intensive industries such garments, footwear, electronics, furniture and some agricultural commodities (coffee and cashew nuts), which mostly remained competitive even during the GFC (Manning, 2010).

²⁸ Research findings are ambiguous with regard to the impact of minimum wages on employment in Indonesia (eg. see for example Suryahadi, 2003; Alatas and Cameron, 2008).

neighboring East Asian countries such as Korea and Taiwan, which have tended to move out of labor-intensive manufacturing because of rising wage costs induced by market factors (Fields, 1994).

We add two qualifications in regard to these findings on employment trends and prospects. First, the employment record in Indonesia improved in the second half of the 2000s, a period not covered by the analysis of input-output tables in this paper. It would be insightful to know how much this turnaround is related to manufacturing exports. Unfortunately we are unable to answer this question, although trends in employment in all large and medium firms suggests a recovery in light industry exports has not been a major factor.²⁹

The final qualification relates to the greater role which services appear to have begun to play in employment, both in relation to exports and more generally. This is a positive development, and one which Indonesia may be able to build on. Although much more information is needed on this important trend, it seems likely that more skill-intensive service employment in areas such as telecommunications, finance and information technology have become more closely integrated with commodity exports, as global linkages have intensified. Especially with judicious government support for the development of skills and talents, they can be expected to play a greater role in job creation in the future.

²⁹ It seems unlikely that there was a turnaround in exports in the light industries that have been a focus of this paper. Output and employment continued to lag in the second half of the 2000s in the light industries that had performed so well in the pre-AFC period. Annex Table 2 presents data on employment in Large and Medium sized firms in manufacturing through to the end of the 2000s.

REFERENCES

- Alatas, V. and L. Cameron (2008) 'The Impact of Minimum Wages on Employment in a Low-Income Country: A Quasi-Natural Experiment in Indonesia', *Industrial and Labor Relations Review*, Vol. 61(2), pp. 201-223.
- Asian Development Bank, 2010, *Asian Development Outlook 2010: Macroeconomic Management Beyond the Crisis*, ADB: Manila, Philippines
- Aswicahyono, H., H. Hill and D. Ardiyanto, 2011, 'Indonesian Industrialization: Jobless Growth?', in C. Manning and S. Sumarto (eds.), *Employment, Living Standards and Poverty in Contemporary Indonesia*, ISEAS, Singapore, pp. 113-33.
- Athukorala, P. and H. Santosa (1997) 'Gains from Indonesian Export Growth: Do Linkages Matter,' *Bulletin of Indonesian Economic Studies*, Vol. 33(2), pp. 73-96.
- Athukorala, P.C., 2006a, 'Product Fragmentation and Trade Patterns in East Asia', *Asian Economic Papers*, 4(3), 1-27.
- Athukorala, P., 2006b, Post-Crisis Export Performance: The Indonesian Experience in Regional Perspective, *Bulletin of Indonesian Economic Studies*, Vol. 42 (2), pp. 177-211.
- Athukorala, P., 2009, 'Economic Transition and Export Performance in Vietnam,' *ASEAN Economic Bulletin*, 26(1), 96-114.
- Bulmer-Thomas, V. (1982) *Input-Output Analysis in Developing Countries: Source, Methods and Applications*, John Wiley and Sons, Chichester.
- Caraway, T., 2004, 'Protective Repression, International Pressures and Institutional Design: Explaining Labour Reforms in Indonesia,' *Studies in Comparative International Development*, 39(3), 28-49.
- Fane, G. and T. Condon (1996) 'Trade Reform in Indonesia', *Bulletin of Indonesian Economic Studies*, Vol. 32(3), 33-54.
- Fields, G. S. (1994) 'Changing Labor Market Conditions and Economic Development in Hong Kong, the Republic of Korea, Singapore and Taiwan, China, *The World Bank Economic Review*, 8(3), pp. 395-114
- Fujita, N. and W. E. James, 1997, 'Employment Creation, and Manufactured Exports in Indonesia, 1980-90,' *Bulletin of Indonesian Economic Studies*, 33 (1), pp. 103-15.
- Garnaut, R. G., 2010, 'The Turning Point in Chinese Economic Development: Conceptual Issues and New Empirical Evidence,' in R. Garnaut, J. Gollay and L. Song (eds.), *China: the Next Twenty Years of Reform and Development*, Australian National University, E-Press, Canberra, pp. 19-37.
- Hill, H., 2000, *The Indonesian Economy Since 1966: Southeast Asia's Emerging Giant*, Cambridge University Press, Cambridge.

- Hirshman, A. O. (1958) *The Strategy of Economic Development*, Yale University Press, New Haven.
- Inter-American Development Bank (IADB), *Good Jobs Wanted: Labor Markets in Latin America*, John Hopkins, Washington D.C..
- James, W. E. and N. Fujita, 2000, 'Employment and Manufacturing Exports in Indonesia: An Input-Output Analysis,' *Working Paper Series 2000-06*, ICSEAD, Kitakyushu.
- Jotzo F. and D. Narjoko, 2007 'Survey of Recent Economic Developments,' *Bulletin of Indonesian Economic Studies*, 43 (1).
- Lal, S. and K. Rao (1995) *Indonesia: Sustaining Manufactured Export Growth*, Ministry of Trade, Jakarta, mimeo
- Manning, C., 1998, *Indonesian Labour in Transition: An East Asian Success Story?* Trade and Development Series, Cambridge University Press, Cambridge, 1998.
- Manning, C. and K. Roesad, 2007, 'The Manpower Law of 2003 and its Implementing Regulations: Genesis, Key Articles and Potential Impact,' *Bulletin of Indonesian Economic Studies*, 43(1), 39-86.
- Manning. C and A. Posso (2010) 'Manufacturing Growth, Trade and Labour Market Outcomes in East Asia: Why did the Southeast Asian Countries Lag Behind?' in Prema-chandra Athukorala (ed) *Product Fragmentation, Trade and Investment in East Asia*, Routledge.
- Manning C., 2011, *Labor Market Structure and Change in Indonesia in the First Decade of the 2000s: Issues Relevant to Trends in Trade and Employment*, Background paper prepared for the OECD-ILO-ADB Conference on Trade and Labor Markets, Manila April 18-19, 2011.
- McLeod, R. M., 2011, 'Survey of Recent Economic Developments,' *Bulletin of Indonesian Economic Studies*, 47(1).
- OECD 2010. *OECD Investment Policy Reviews: Indonesia – Overview of Progress and Policy Changes*, OECD: Paris.
- Pritchett, L., 2011, 'How Good are Good Transitions For Growth and Poverty? Indonesia since Suharto, for instance', in C. Manning and S. Sumarto (eds.), *Employment, Living Standards and Poverty in Contemporary Indonesia*, ISEAS, Singapore, pp. 23-46.
- Ranis, G., 2004, *Labor Surplus Economies*, Center Discussion Paper 900, Economic Growth Center, Yale University
- Soesastro, H. and C. Basri, 1998, 'Survey of Recent Economic Developments,' *Bulletin of Indonesian Economic Studies*, 34(1).
- Sugiyarto, G., M. Oey-Gardiner, and N. Triaswati. 2006. "Labor Markets in Indonesia: Key Challenges and Policy Issues." In J. Felipe and R. Hasan, eds., *Labor Markets in Asia: Issues and Perspectives.*, London: Palgrave Macmillan for the Asian Development Bank.

- Suryahadi, A., W. Widyanti, D. Perwira and S. Sumarto, 2003, 'Minimum Wage Policy and its Impact on Employment in the Urban Formal Sector, *Bulletin of Indonesian Economic Studies*, 39(1), pp. 29-50.
- Thirwell, A.P. (2003) *Growth and Development with Special Reference to Developing Economies*, Palgrave, MacMillan, London.
- World Bank, 1993, *The East Asian Miracle: Economic Growth and Public Policy*. New York: Oxford University Press.
- World Bank, 2010, *Indonesia Jobs Report: Towards Better Jobs and Social Security for All*, World Bank, Washington D.C.

Table 1: Economic Growth and Employment in Major Sectors, Before, During and After the Asian Financial Crisis, Indonesia (1985-2005)

		Growth Rates (% p.a.)			Distribution (%)		
		1985-95	1995-00	2000-05	1985	1995	2005
Output							
Primary Ind.		5.5	-0.9	2.4	34	20	20
Manufacturing	Food Processing	12.6	-1.9	1.9	10	12	9
	Light Industry	17.8	-1.2	1.8	4	9	8
	Heavy Industry & Chem.	15.1	-1.0	3.7	8	12	16
Services		11.5	-2.1	3.5	44	47	47
TOTAL		10.8	-1.6	3.0	100	100	100
Employment							
Primary Ind.		1.1	0.0	0.2	57	48	46
Manufacturing	Food Processing	9.3	-1.1	-2.5	2	4	2
	Light Industry	6.2	0.9	0.4	4	6	7
	Heavy Industry & Chem.	6.4	-0.1	1.1	2	3	3
Services		3.8	0.8	0.1	35	39	43
TOTAL		2.7	0.3	0.1	100	100	100

Source: Computed from the Input-Output Tables and the National Labor Force data, various years.

Table 2: Distribution and Growth of Exports by Industry Group, Indonesia, 1985-2005*

Sector	Distribution (%)			Growth Rates (% p.a.)			
	1985	1995	2005	1985-1995	1995-2005		Total
					1995-00	2000-05	
Primary Sectors	71.4	25.6	31.6	-0.5	5.1	11.5	8.3
Food Processing	0.5	5.3	7.2	30	3.8	14.6	9.2
Light Industries	7.4	25.6	16.9	22.5	3.8	0.2	2
Heavy & Chemical Indust.	7.9	17.6	23.7	18	11.5	6.8	9.1
Services	12.8	26.1	20.6	17.1	-2.7	10.3	3.8
Total: %	100	100	100	9.9	4.3	8.0	6.2
Total: \$ billion	20.3	54.4	100.7				

* Current US\$ values

Source: Computed from the Input-Output Tables and National Labor Force Data, Statistics Indonesia, various years.

Table 3: Employment Induced by Total Exports, Indonesia 1985-2005

	1985	1995	2000	2005
Total Employment (m.)	66.5	87.3	93.3	95.5
Employment induced by exports (m.)*	4.7	10.3	17.8	15.8
% of total employment	7.1	11.8	19.0	16.6
Export (Billion Rupiah)	22,523	122,360	569,490	977,105
Exchange rate	1,111	2,249	8,422	9,705
Deflator	0.797	0.875	1.000	1.033
Export (million dollar, current)	20,272	54,406	67,619	100,681
Export (million dollar, constant)	25,444	62,207	67,619	97,420
Empl. Induced/US\$ 1 million, current	234	189	263	157

Source: Computed from the Input-Output Tables and National Labor Force Data, Statistics Indonesia, various years.

Table 4: Distribution and Growth of Employment Induced by Exports by Industry Group, Indonesia, 1985-2005

Sector	Distribution of jobs (%)	Growth (% p.a.)		Share of Jobs Created (%)	
		1985	1985-95	1995-05	1985-95
Primary Sectors	39.6	1.9	5.9	7.2	33.3
Food Processing	0.8	18.4	2.6	3.6	1.3
Light Industries	18.8	10.5	3.2	29.6	17.1
Heavy & Chemical Industries	3.8	10.5	5.0	6.0	6.0
Services	37.0	9.9	4.0	53.6	42.2
Total: %	100.0	7.8	4.3	100.0	100.0
Total: Million	4.74			5.56	5.52

Source: Computed from the Indonesia Input-Output Tables, Statistics Indonesia, 1985, 1995 and 2005.

Table 5: Share of All Employment Contributed by Export Activities by Major Industry, Indonesia Pre- and Post Crisis, 1985-2005

Industry	Total no. of jobs (million)		% of all jobs in export industries		% of all new jobs created by exports	
	1985	2005	1985	2005	1985-95	1995-2005
Primary	37.7	43.6	5.0	9.5	9.6	110.5*
Food Processing	1.5	1.8	2.5	16.8	8.8	**
Light Industries	2.7	6.4	33.6	54.9	73.0	65.6
H & C Industries	1.3	3.0	13.8	28.1	28.7	61.2
Services	23.3	40.7	7.5	17.4	27.3	36.0
ALL INDUSTRIES	66.5	95.5	7.1	16.6	26.7	67.4
Total Jobs (m.)					20.8	8.2

* Employment in domestic industries declined

** Employment growth was negative overall, though it did increase in export industries

Source: Computed from the Input-Output Tables and National Labor Force Data, Statistics Indonesia, various years.

Table 6: Growth Rates of Exports and Employment in Light and Heavy Manufacturing, Indonesia, 1985-2005 (% per annum)

Industry Groups/Industries	Value of Exports*		Employment		Gth. of Exports÷Gth. of Emp.	
	1985-95	1995-05	1985-95	1995-05	1985-95	1995-05
Light Industry						
TCF	25.5	2.0	12.9	5.2	2.0	0.4
Wood & Wood Products	16.7	-1.4	7.3	5.4	2.3	-0.3
Paper/Paper Prods & Printing	41.5	7.5	22.7	20.1	1.8	0.4
Spinning Industries	40.9	6.4	15.3	10.2	2.7	0.6
Other	32.3	3.1	30.2	6.3	1.1	0.5
<i>Sub-total</i>	<i>22.5</i>	<i>2.0</i>	<i>10.8</i>	<i>6.1</i>	<i>2.1</i>	<i>0.3</i>
Heavy Industry						
Machinery & Electrical	34.3	37.8	22.2	28.8	1.5	1.3
Rubber Products	13.7	7.0	6.2	3.4	2.2	2.1
Chemical Industries	22.1	19.8	9.2	9.6	2.4	2.1
Non-ferrous Basic Metal Industries	6.0	8.5	0.8	5.6	7.1	1.5
Transport Equip, Manuf./Repair	27.1	11.1	17.7	8.1	1.5	1.4
Non-metallic Minerals	37.4	16.4	30.2	11.6	1.2	1.4
Other (NEC)	21.4	10.1	23.3	14.5	0.9	0.7
<i>Sub-total</i>	<i>18.0</i>	<i>17.5</i>	<i>11.3</i>	<i>9.9</i>	<i>1.6</i>	<i>1.8</i>
Total**	21.1	12.6	10.8	6.6	2.0	1.9

* Growth in the US\$ value of exports (current prices).

** Includes processed foods

Source: Computed from the Input-Output Tables, Statistics Indonesia 1985, 1995, 2005.

Table 7 Jobs Created through Own Exports and Linkages with Other Sectors, Indonesia 1995 and 2005

Sectors in which jobs were generated	Exporting Sector				
	Primary	Industry			Services
		Food Processing	Light Industry	Heavy&Chem Industry	
1995					
Primary Sector	74.8	65.6	10.2	19.5	13.3
Industry					
<i>Process</i>	0.3	18.4	0.1	0.2	1.1
<i>Light</i>	1.0	0.4	67.5	1.9	0.7
<i>H&C Industries</i>	1.7	0.6	1.1	38.1	0.7
Services	22.3	15.1	21.0	40.3	84.1
Total	100.0	100.0	100.0	100.0	100.0
Number of workers (m.)	0.7	1.0	3.7	1.1	3.8
2005					
Primary Sector	80.3	69.8	7.4	18.9	14.5
Industry					
<i>Process</i>	0.1	12.7	0.2	0.2	0.6
<i>Light</i>	0.6	0.5	74.4	2.4	1.1
<i>H&C Industries</i>	1.8	0.7	0.9	34.7	0.6
Services	17.1	16.2	17.2	43.8	83.2
Total	100.0	100.0	100.0	100.0	100.0
Number of workers (m.)	1.4	2.0	4.5	2.1	5.8

Source: Computed from the Input-Output Tables, Statistics Indonesia, 1995 and 2005.

Annex Table 1: Employment by Industry, Indonesia 1985-2005
(number of persons)

No	Description	1985	1990	1995	2000	2005
1	Paddy	195835	98677	183709	221741	319724
2	Handpounded Rice	663	144812	125735	171088	140748
3	Maize	14870	206162	186001	191367	213566
4	Root Crops & Flour	104577	61493	86971	102616	122033
5	Vegetables & Fruits	45201	112300	183066	183458	410224
6	Other Farm Food Crops	42831	129524	15867	49041	35864
7	Rubber	173093	186987	191893	284418	276851
8	Sugar Cane & Brown Sugar	16111	48993	42714	54600	118783
9	Coconut	56114	50480	105683	165170	186457
10	Crude Coconut & Palm Oil	126582	145915	109991	271879	572805
11	Tobacco	50138	66964	74238	34071	26876
12	Coffee	450819	140630	48933	66685	477896
13	Tea	148843	124812	23638	26384	28446
14	Cloves	1885	8781	5932	30297	30088
15	Pepper & Nutmeg	25517	24597	36335	29337	12160
16	Other Estate Crops	49477	54616	69171	143992	152629
17	Other Crops	9651	16386	29668	43118	32752
18	Livestock	13899	66630	54328	96353	85117
19	Slaughtering	11325	34095	36156	70734	48274
20	Poultry (& Products)	10609	37035	57004	88799	82288
21	Logging & Sawmilling	75489	260448	238704	272144	131121
22	Other Forest Products	26559	18038	26647	45910	42004
23	Fisheries	97821	144548	124257	151255	240118
24	Coal & Metal Ore Mining	49589	100487	125640	149737	162212
25	Petroleum & Natural Gas	60639	61697	55646	75549	88763
26	Other Quarrying	9680	26265	28522	53702	34295
41	Petroleum Refineries	12557	15217	14784	33287	50017
<i>SUB-TOTAL PRIMARY</i>		<i>1880375</i>	<i>2386588</i>	<i>2281231</i>	<i>3106732</i>	<i>4122110</i>
27	Processed & Preserved Foods	1483	69773	45802	92457	72772
28	Oil & Fats	1395	32681	54663	85081	136388
29	Rice Milling, Cleaning & Polishing	3863	5306	11726	11907	11532
30	Wheat Flour & Products	3174	16837	17481	22273	16332
31	Sugar Refining	3956	12510	12619	10447	17102
32	Food Products n.e.c.	22169	111763	65993	85058	37761
33	Beverage Industries	1084	7012	5543	6243	2819
34	Cigarettes	559	3789	24440	24743	12924
<i>SUB-TOTAL FOOD PROCESSING</i>		<i>37682</i>	<i>259671</i>	<i>238268</i>	<i>338208</i>	<i>307630</i>

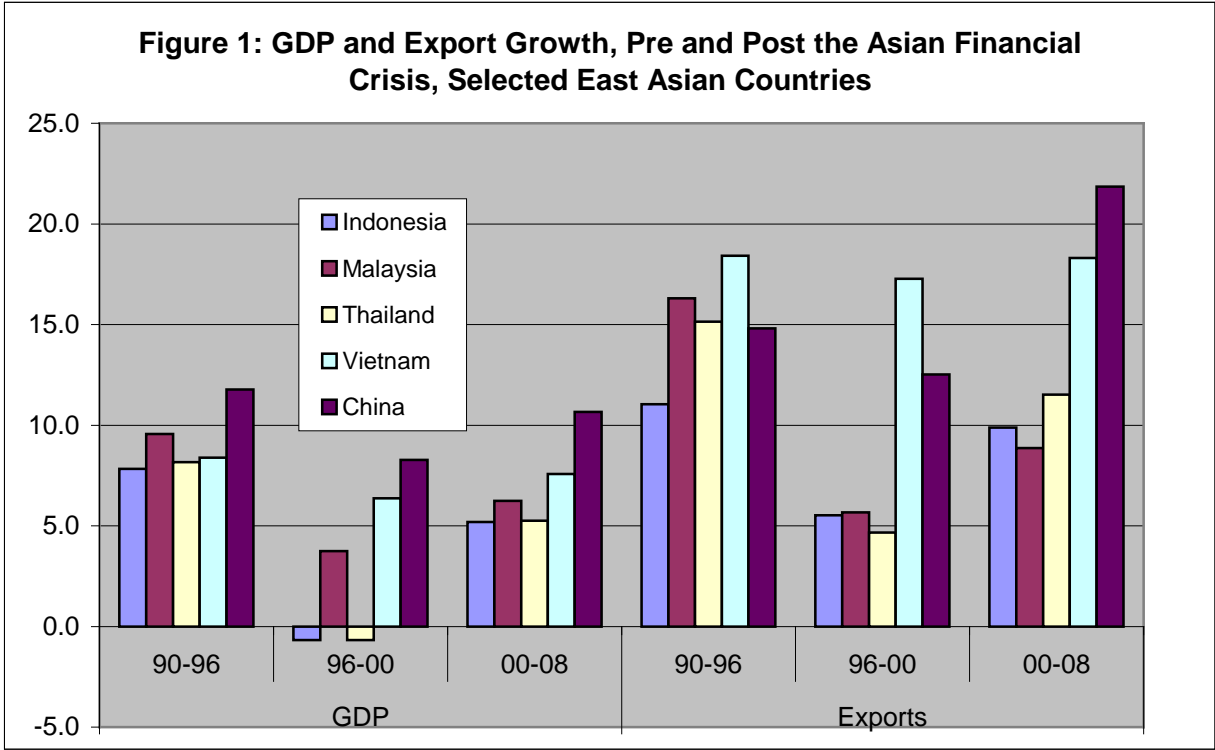
No	Description	1985	1990	1995	2000	2005
35	Spinning Industries	29969	115622	129711	318645	269460
36	Textile, Leather & Wearing Apparel	287033	933775	988380	1554096	1272941
37	Wood & Wood Products	551019	1083561	1136394	1858477	1382697
38	Paper, Paper Products & Printing	11991	34165	69829	205321	237208
50	Other Manufacturing n.e.c.	11580	202226	214022	368190	322621
<i>SUB-TOTAL LIGHT INDUSTRY</i>		<i>891592</i>	<i>2369348</i>	<i>2538334</i>	<i>4304729</i>	<i>3484927</i>
39	Fertilizers & Pesticides	3198	7251	6950	34970	46135
40	Chemical Industries	21696	47047	52873	109965	63871
42	Rubber Products	60912	110375	115699	158038	167759
43	Non-metallic Minerals	8341	62342	97196	190411	146625
44	Cement	3852	21815	3858	23758	14929
45	Iron & Steel Industries	1501	5206	5022	14854	12296
46	Non-ferrous Basic Metals	45981	41125	50019	70958	85800
47	Prefabricated Metal Products	6808	23026	42991	69293	64754
48	Machinery, Electrical & Access.	13261	16150	80009	193566	160303
49	Manuf. & Repair of Transport Equip.	12853	39928	55154	85004	81156
<i>SUB-TOT HEAVY & CHEM. INDUSTRY</i>		<i>178402</i>	<i>374263</i>	<i>509771</i>	<i>950816</i>	<i>843628</i>
51	Electricity, Gas & Water	7731	17195	23901	61920	36170
52	Construction	27392	36471	46300	99562	89068
53	Trade	1130092	2031418	2494464	5211225	3985648
54	Restaurants & Hotels	24432	52825	109844	450845	315954
55	Railways	4382	6642	11276	29820	9248
56	Road Transport	101780	270499	663238	1060753	634603
57	Water Transport	75554	97883	139369	165985	350264
58	Air Transport	4915	5220	10804	19349	35808
59	Services Allied to Transport	60231	48510	110337	332052	200091
60	Communications	7494	8988	18952	78489	156889
61	Financial Intermediaries	25426	60178	123932	192412	101093
62	Real Estate & Business Services	5442	13369	30043	169150	175885
63	Public Administration	0	0	29691	77807	87281
64	Social & Community Services	28048	40494	56659	74467	250599
65	Culture & Amusement Services	252739	343513	549999	892705	594171
66	Unspecified Sectors	0	442727	316005	94044	44116
<i>SUB-TOTAL SERVICES</i>		<i>1755658</i>	<i>3475934</i>	<i>4734813</i>	<i>9010586</i>	<i>7066890</i>
TOTAL		4743709	8865805	10302416	17711072	15825185

Source: Computed from the Indonesian Input-Output Tables, 1985, 1990, 1995, 2000 and 2005.

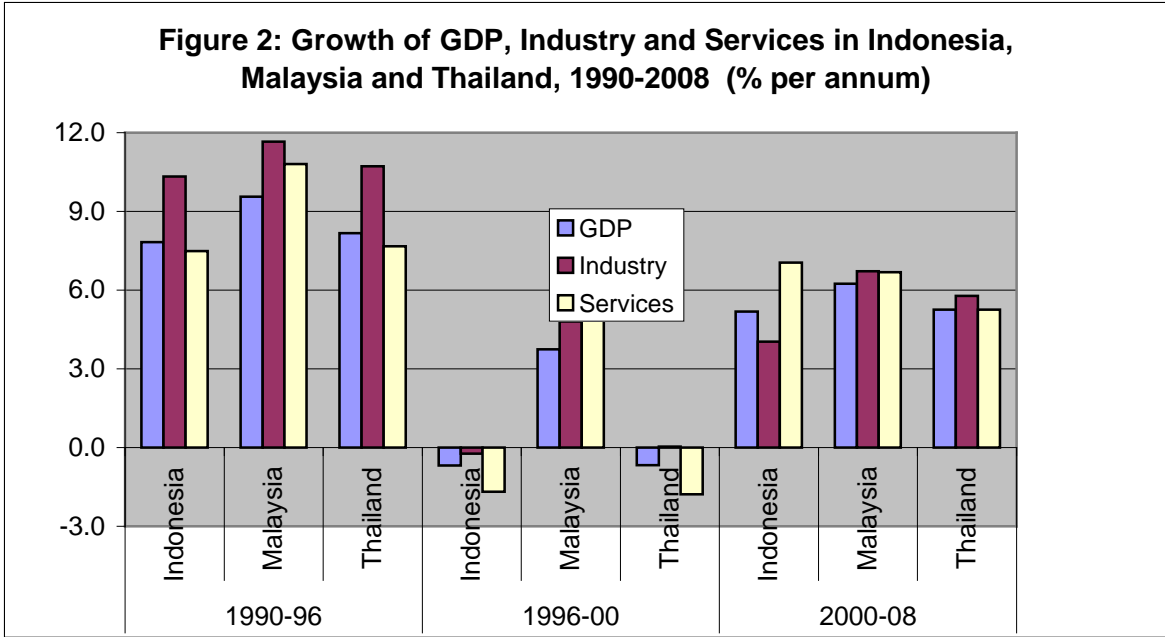
Annex Table 2: Index and Share of Employment in Selected Industries in Large and Medium Firms in Manufacturing, Indonesia 1990-2009

	Index of employment (2000=100)				Share of employment (%)		
	1990	2000	2005	2009	1990	2000	2009
Food products and beverages	69	100	107	141	15.4	13.7	18.9
<i>Selected Light industries</i>							
Textiles	63	100	86	56	15.6	15.2	8.3
Garments	51	100	94	80	9.1	11.1	8.7
Wood and wood products	84	100	80	69	12.3	9.0	6.1
Furniture and other	39	100	93	120	12.3	9.0	6.1
					49.1	44.3	31.2
<i>Selected Heavy Industries and Chemicals</i>							
Chemical and chemical products	70	100	108	81	5.1	4.5	3.6
Rubber and plastics products	85	100	115	180	9.3	6.7	11.9
Other non-metallic mineral products	68	100	98	77	4.3	3.9	2.9
Electronics and communications	19	100	91	118	1.1	3.6	4.1
Motor vehicles and related	76	100	145	118	1.4	1.1	1.3
Other transportation equipment	71	100	86	118	1.8	1.6	1.8
					23.0	21.4	26.6
All Manufacturing	61	100	98	102			

Source: Survey of Large and Medium Manufacturing, various years.

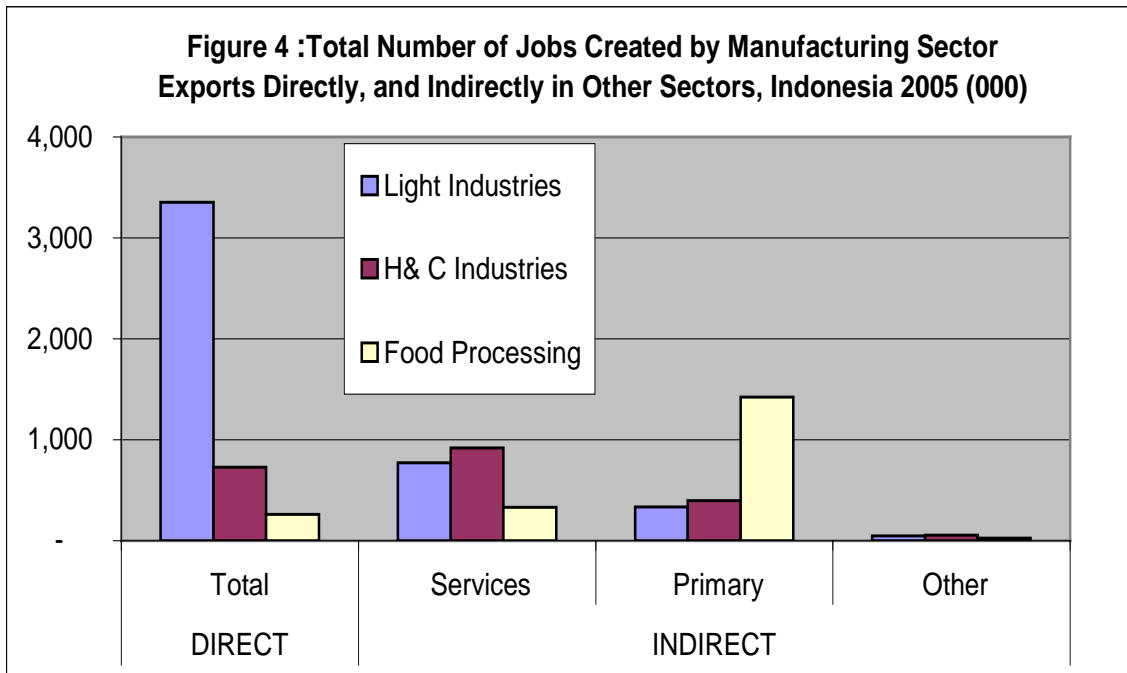


Source: Asian Development Bank, Key Indicators, 2010



Source: Asian Development Bank, Key Indicators, 2010





Source: *Source:* Computed from the Input-Output Tables, Statistics Indonesia, 2005.

Working Papers in Trade and Development
List of Papers (including publication details as at 2011)

- 07/01 KELLY BIRD, SANDY CUTHBERTSON and HAL HILL, 'Making Trade Policy in a New Democracy after a Deep Crisis: Indonesia
- 07/02 RAGHBENDRA JHA and T PALANIVEL, 'Resource Augmentation for Meeting the Millennium Development Goals in the Asia Pacific Region'
- 07/03 SATOSHI YAMAZAKI and BUDY P RESOSUDARMO, 'Does Sending Farmers Back to School have an Impact? A Spatial Econometric Approach'
- 07/04 PIERRE VAN DER ENG, 'De-industrialisation' and Colonial Rule: The Cotton Textile Industry in Indonesia, 1820-1941'
- 07/05 DJONI HARTONO and BUDY P RESOSUDARMO, 'The Economy-wide Impact of Controlling Energy Consumption in Indonesia: An Analysis Using a Social Accounting Matrix Framework'
- 07/06 W MAX CORDEN, 'The Asian Crisis: A Perspective after Ten Years'
- 07/07 PREMA-CHANDRA ATHUKORALA, 'The Malaysian Capital Controls: A Success Story?'
- 07/08 PREMA-CHANDRA ATHUKORALA and SATISH CHAND, 'Tariff-Growth Nexus in the Australian Economy, 1870-2002: Is there a Paradox?'
- 07/09 ROD TYERS and IAN BAIN, 'Appreciating the *Renbimbi*'
- 07/10 PREMA-CHANDRA ATHUKORALA, 'The Rise of China and East Asian Export Performance: Is the Crowding-out Fear Warranted?'
- 08/01 RAGHBENDRA JHA, RAGHAV GAIHA AND SHYLASHRI SHANKAR, 'National Rural Employment Guarantee Programme in India – A Review'
- 08/02 HAL HILL, BUDY RESOSUDARMO and YOGI VIDYATTAMA, 'Indonesia's Changing Economic Geography'
- 08/03 ROSS H McLEOD, 'The Soeharto Era: From Beginning to End'
- 08/04 PREMA-CHANDRA ATHUKORALA, 'China's Integration into Global Production Networks and its Implications for Export-led Growth Strategy in Other Countries in the Region'
- 08/05 RAGHBENDRA JHA, RAGHAV GAIHA and SHYLASHRI SHANKAR, 'National Rural Employment Guarantee Programme in Andhra Pradesh: Some Recent Evidence'
- 08/06 NOBUAKI YAMASHITA, 'The Impact of Production Fragmentation on Skill Upgrading: New Evidence from Japanese Manufacturing'
- 08/07 RAGHBENDRA JHA, TU DANG and KRISHNA LAL SHARMA, 'Vulnerability to Poverty in Fiji'

- 08/08 RAGHBENDRA JHA, TU DANG, 'Vulnerability to Poverty in Papua New Guinea'
- 08/09 RAGHBENDRA JHA, TU DANG and YUSUF TASHRIFOV, 'Economic Vulnerability and Poverty in Tajikistan'
- 08/10 RAGHBENDRA JHA and TU DANG, 'Vulnerability to Poverty in Select Central Asian Countries'
- 08/11 RAGHBENDRA JHA and TU DANG, 'Vulnerability and Poverty in Timor- Leste'
- 08/12 SAMBIT BHATTACHARYYA, STEVE DOWRICK and JANE GOLLEY, 'Institutions and Trade: Competitors or Complements in Economic Development?'
- 08/13 SAMBIT BHATTACHARYYA, 'Trade Liberalization and Institutional Development'
- 08/14 SAMBIT BHATTACHARYYA, 'Unbundled Institutions, Human Capital and Growth'
- 08/15 SAMBIT BHATTACHARYYA, 'Institutions, Diseases and Economic Progress: A Unified Framework'
- 08/16 SAMBIT BHATTACHARYYA, 'Root causes of African Underdevelopment'
- 08/17 KELLY BIRD and HAL HILL, 'Philippine Economic Development: A Turning Point?'
- 08/18 HARYO ASWICAHYONO, DIONISIUS NARJOKO and HAL HILL, 'Industrialization after a Deep Economic Crisis: Indonesia'
- 08/19 PETER WARR, 'Poverty Reduction through Long-term Growth: The Thai Experience'
- 08/20 PIERRE VAN DER ENG, 'Labour-Intensive Industrialisation in Indonesia, 1930-1975: Output Trends and Government policies'
- 08/21 BUDY P RESOSUDARMO, CATUR SUGIYANTO and ARI KUNCORO, 'Livelihood Recovery after Natural Disasters and the Role of Aid: The Case of the 2006 Yogyakarta Earthquake'
- 08/22 PREMA-CHANDRA ATHUKORALA and NOBUAKI YAMASHITA, 'Global Production Sharing and US-China Trade Relations'
- 09/01 PIERRE VAN DER ENG, 'Total Factor Productivity and the Economic Growth in Indonesia'
- 09/02 SAMBIT BHATTACHARYYA and JEFFREY G WILLIAMSON, 'Commodity Price Shocks and the Australian Economy since Federation'
- 09/03 RUSSELL THOMSON, 'Tax Policy and the Globalisation of R & D'
- 09/04 PREMA-CHANDRA ATHUKORALA, 'China's Impact on Foreign Trade and Investment in other Asian Countries'
- 09/05 PREMA-CHANDRA ATHUKORALA, 'Transition to a Market Economy and Export Performance in Vietnam'

- 09/06 DAVID STERN, 'Interfuel Substitution: A Meta-Analysis'
- 09/07 PREMA-CHANDRA ATHUKORALA and ARCHANUN KOHPAIBOON, 'Globalization of R&D US-based Multinational Enterprises'
- 09/08 PREMA-CHANDRA ATHUKORALA, 'Trends and Patterns of Foreign Investments in Asia: A Comparative Perspective'
- 09/09 PREMA-CHANDRA ATHUKORALA and ARCHANUN KOHPAIBOON, 'Intra-Regional Trade in East Asia: The Decoupling Fallacy, Crisis, and Policy Challenges'
- 09/10 PETER WARR, 'Aggregate and Sectoral Productivity Growth in Thailand and Indonesia'
- 09/11 WALEERAT SUPHANNACHART and PETER WARR, 'Research and Productivity in Thai Agriculture'
- 09/12 PREMA-CHANDRA ATHUKORALA and HAL HILL, 'Asian Trade: Long-Term Patterns and Key Policy Issues'
- 09/13 PREMA-CHANDRA ATHUKORALA and ARCHANUN KOHPAIBOON, 'East Asian Exports in the Global Economic Crisis: The Decoupling Fallacy and Post-crisis Policy Challenges'.
- 09/14 PREMA-CHANDRA ATHUKORALA, 'Outward Direct Investment from India'
- 09/15 PREMA-CHANDRA ATHUKORALA, 'Production Networks and Trade Patterns: East Asia in a Global Context'
- 09/16 SANTANU GUPTA and RAGHBENDRA JHA, 'Limits to Citizens' Demand in a Democracy'
- 09/17 CHRIS MANNING, 'Globalisation and Labour Markets in Boom and Crisis: the Case of Vietnam'
- 09/18 W. MAX CORDEN, 'Ambulance Economics: The Pros and Cons of Fiscal Stimuli'
- 09/19 PETER WARR and ARIEF ANSHORY YUSUF, 'International Food Prices and Poverty in Indonesia'
- 09/20 PREMA-CHANDRA ATHUKORALA and TRAN QUANG TIEN, 'Foreign Direct Investment in Industrial Transition: The Experience of Vietnam'
- 09/21 BUDY P RESOSUDARMO, ARIEF A YUSUF, DJONI HARTONO and DITYA AGUNG NURDIANTO, 'Implementation of the IRCGE Model for Planning: IRSA-INDONESIA15 (Inter-Regional System of Analysis for Indonesia in 5 Regions)'
- 10/01 PREMA-CHANDRA ATHUKORALA, 'Trade Liberalisation and The Poverty of Nations: A Review Article'
- 10/02 ROSS H McLEOD, 'Institutionalized Public Sector Corruption: A Legacy of the Soeharto Franchise'

- 10/03 KELLY BIRD and HAL HILL, 'Tiny, Poor, Landlocked, Indebted, but Growing: Lessons for late Reforming Transition Economies from Laos'
- 10/04 RAGHBENDRA JHA and TU DANG, 'Education and the Vulnerability to Food Inadequacy in Timor-Leste'
- 10/05 PREMA-CHANDRA ATHUKORALA and ARCHANUN KOHPAIBOON, 'East Asia in World Trade: The Decoupling Fallacy, Crisis and Policy Challenges'
- 10/06 PREMA-CHANDRA ATHUKORALA and JAYANT MENON, 'Global Production Sharing, Trade Patterns and Determinants of Trade Flows'
- 10/07 PREMA-CHANDRA ATHUKORALA, 'Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?'
- 10/08 BUDY P RESOSUDARMO, ARIANA ALISJAHBANA and DITYA AGUNG NURDIANTO, 'Energy Security in Indonesia'
- 10/09 BUDY P RESOSUDARMO, 'Understanding the Success of an Environmental Policy: The case of the 1989-1999 Integrated Pest Management Program in Indonesia'
- 10/10 M CHATIB BASRI and HAL HILL, 'Indonesian Growth Dynamics'
- 10/11 HAL HILL and JAYANT MENON, 'ASEAN Economic Integration: Driven by Markets, Bureaucrats or Both?'
- 10/12 PREMA-CHANDRA ATHUKORALA, 'Malaysian Economy in Three Crises'
- 10/13 HAL HILL, 'Malaysian Economic Development: Looking Backwards and Forward'
- 10/14 FADLIYA and ROSS H McLEOD, 'Fiscal Transfers to Regional Governments in Indonesia'
- 11/01 BUDY P RESOSUDARMO and SATOSHI YAMAZAKI, 'Training and Visit (T&V) Extension vs. Farmer Field School: The Indonesian'
- 11/02 BUDY P RESOSUDARMO and DANIEL SURYADARMA, 'The Effect of Childhood Migration on Human Capital Accumulation: Evidence from Rural-Urban Migrants in Indonesia'
- 11/03 PREMA-CHANDRA ATHUKORALA and EVELYN S DEVADASON, 'The Impact of Foreign Labour on Host Country Wages: The Experience of a Southern Host, Malaysia'
- 11/04 PETER WARR, 'Food Security vs. Food Self-Sufficiency: The Indonesian Case'
- 11/05 PREMA-CHANDRA ATHUKORALA, 'Asian Trade Flows: Trends, Patterns and Projections'
- 11/06 PAUL J BURKE, 'Economic Growth and Political Survival'
- 11/07 HAL HILL and JUTHATHIP JONGWANICH, 'Asia Rising: Emerging East Asian Economies as Foreign Investors'

- 11/08 HAL HILL and JAYANT MENON, 'Reducing Vulnerability in Transition Economies: Crises and Adjustment in Cambodia'
- 11/09 PREMA-CHANDRA ATHUKORALA, 'South-South Trade: An Asian Perspective'
- 11/10 ARMAND A SIM, DANIEL SURYADARMA and ASEP SURYAHADI, 'The Consequences of Child Market Work on the Growth of Human Capital'
- 11/11 HARYO ASWICAHYONO and CHRIS MANNING, 'Exports and Job Creation in Indonesia Before and After the Asian Financial Crisis'