Chapter 11

The Source of Production, Employment and Productivity in Indonesia

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CHAPTER 11

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Interest in the impact of globalizing corporate activities and deepening economic integration on the performance of local firms has developed over the last decade. The interest has led to a new and rapidly expanding body of literature on the subject. Our paper attempts to observe the source of output, employment, and productivity over three periods, namely, 1) the pre-crisis period (1990-1996), 2) the crisis and recovery period (1996-2000), and 3) the post-crisis period (2000-2006). We find that high output during the pre-crisis period was driven significantly from the existing firms. The trend, however, reversed in the 1996-2000 period where the source of manufacturing output was from new-entrants. In the context of employment, we witness that the exporting firms consistently provide more jobs than the non-exporting firms. Interestingly, prior to crisis, Non-FDI firms create much more job compare to that of FDI firms. The situation was reversed post crisis with FDI firms created more job than Non-FDI. Concerning labor productivity, we observe a significant drop in Non-FDI firms. In contrast the contribution of FDI in manufacturing productivity is consistently increasing throughout the periods. The finding also reinforces the significant role of FDI in improving labor productivity over periods. The story is similar to exporting-non exporting firms, where labor productivity of exporting firms also improves throughout period.

1. Introduction

Interest surrounding the impact of globalizing corporate activities and deepening economic integration on the performance of local firms has developed over the last decade. The interest has led to a new and rapidly expanding body of literature on the subject. As a result, the literature has generated new insights on why some firms export abroad and others do not, why some firms fail to survive under intense pressure from globalization, whilst others do, and why some choose to invest abroad rather than export. Another strand of literature seeks to answer the question of whether the presence of MNE (Multi National Enterprises) and exporting activities have a positive impact on domestic firms. In short, the new literature sheds light on the key drivers of globalization and the impact of the phenomenon on local firms' performance.

In addition to this literature, another branch of study also explores the impact of firm behavior on the whole economy. Three channels can be observed as the main sources of economic growth, namely, production, employment, and productivity. In Indonesia some studies have been conducted on the decomposition of labor growth according to components of GDP (Gross Domestic Product) growth (Aswicahyono and Kartika 2009) and productivity of the national economy by using the Total Factor Productivity approach (Aswicahyono 2000). However, a question remains on whether the sources of the Indonesian labor enlargement in 1975 – 2000 are from labor productivity, domestic demand, export expansion, or import substitution.

This question is still highly relevant as Indonesia has experienced unemployment since the 1997/1998 economic crisis. While the economy grew moderately between 2000 and 2004, unemployment rates were still high and the formal sector was stagnant. It is expected that by decomposing the sources of production growth, employment and productivity, we may come up with a better understanding of how trade policies and globalization affect these variables. Therefore, this study attempts to learn from the country's experience what factors in the economy drive employment. Thus, the period observed is 1975 to 2006 as the country went through a boom and bust period as well as major policy development during that period. Our analysis will be divided into three

periods before and after the 1998 economic crisis; 1)1990-1996 (pre-crisis period), 2) 1996-2000 (crisis & recovery period), and 3) 2000-2006 (post crisis period).

2. Literature Review

In regard to a review study of empirical research on the impact of globalization on firm activities, Hayakawa, Kimura and Machikita's study offers excellent references to such studies. Hayakawa *et al.* (Hayakawa *et al.*, 2009) summarize empirical research as aiming to understand the relationship between globalization and the behavior of firms. Moreover, the study, discusses the use of micro data in observing firm behavior in reaction to policy measures on globalization. It reviews topics regarding firm behaviors in response to globalization, ranging from the selection of investing and exporting derived theoretically from the Melitz model; selection of outward investment country destinations; entry mode choice; selection of dead or surviving firms; selection of the number of varieties; products and resource changes; roles of outward and inward FDI; agglomeration and changes in the source of employment, production and productivity (i.e. decomposition). Apart from several studies and methodologies investigating firm-level behaviors in response to globalization, the decomposition methodology (production, employment and productivity) is a methodology assessing the impact of changes at firm level on the national economy. The approach might seem simple compared to other methods utilizing plant-level datasets though it reasonably captures the dynamic changes of firms as it also relies heavily on micro level data (e.g. exit and entry plants).

There are three issues concerning decomposition that are discussed in this paper. First is the impact of firm dynamics on employment creation (decomposition of employment). Second is the variation of output changes due to the behavior of firms throughout the period (decomposition of output). Lastly is the change of labor productivity because of firm dynamics (decomposition of productivity).

A well-known study of employment decomposition is Davis, Haltiwanger, and Schuh's research on job creation and destruction in US manufacturing (Davis *et al.*,

1996). The study investigates forces that impinge on the distribution of labor demand across industries, including the dynamics of output markets, firm and industry restructuring, and competition, both at a domestic and foreign level. As plan-level data becomes increasingly available, there is a growing body of studies investigating the trend of job creation and destruction (for example Davis and Haltiwanger 1990, 2001, Basker 2005, Ibsen and Westergaard-Nielsen 2004,Bentivogli and Pagano 1999, Klein, Schuh and Triest 2002).

Ibsen and Nielsen (2004) observed that job destruction and job creation could be caused by 1) the effect of economic policies, 2) the degree of in and outsourcing of firms and 3) the firm's ability to create new ideas that can be transformed into jobs. Moreover, job destruction and job creation are also the result of corporate strategies (e.g. maximizing the potential economic outcome). Moreover, the dynamics of job creation and destruction are most likely related to labor laws, firm-specific strategies, and the role of the educational system. Though the unemployment rate may give an apparent picture of the employment situation at an aggregate level, job creation and destruction indicators offer more indicative measures on the plant-level situation. In other words, the indicators are central in measuring how well the economy functions and how it adjusts to some forces, such as technological changes, managerial skills, and international outsourcing, etc.

By definition, job destruction is related to a process where the person is separated from the workplace and then, he or she will look for another job, retire, continue to study, etc. Meanwhile, in the case of job creation, the internal departments of a company will look for a candidate to fill a job function. They might hire someone who is already unemployed or who already has a job in a company and is interested in a move to another company. Therefore, job destruction and job creation are systematically related to the size of the workplace, average educational level, region, and industry growth.

On the decomposition of production, a strand of literature surrounding this area benefits from a novel plant-level dataset. In the context of the developed countries, where longitudinal firm level data are available, there are many studies focusing on reallocation as a source of industry output because of firm entry or exit or the dynamic pattern of composition of output across firms. For the United States, Bernard and

Jensen's studies are well-known areas of research focusing on the decomposition of US production growth (2004, 2007). A further study by Bernard, Redding and Scott focuses on the frequency and determinants of product switching in the US manufacturing sector. They found that product switching alters firm behavior in reallocating resources or inputs in order to gain the most efficient usage.

Furthermore, labor productivity decomposition at firm-level can be traced to several studies (in the United States for Baily, Bartelsman and Haltiwanger 1994; Baldwin 1995; Haltiwanger 1997; and Bartelsman and Doms 2000; in the case of Israel Griliches and Regev 1995; in the case of Taiwan Aw, Chen and Roberts 2001; Australia; Bland and Will 2001). Many experts have reached the conclusion that firm performance varies greatly, even among firms which share similar characteristics.

A study by Aw, Chen and Roberts finds that the high growth of output in Taiwan's manufacturing sector has been associated with the high rates of firm entries and exits. Using panel data, they found that new entrant firms have lower productivity though their performance is still heterogeneous. Furthermore, exiting firms have been shown to be less productive than continuing or surviving firms. Moreover, they also noted that the productivity differential between new entrants and exiting firms plays a key role as the source of productivity growth in manufacturing and it accounted for one-half of industrial improvement (Aw, Chen and Roberts 2001). Unlike Aw, Chen and Roberts' findings, Griliches and Regev found that the growth of productivity largely comes from productivity growth within firms rather than from new-entrant, exiting firms or differential growth of firms from earlier periods.

Bland and Will specifically observe labor productivity within a sample of Australian manufacturing. While hypothesis suggests that the change in labor productivity is forced by the movement of resources from less to more productive firms, the study finds no clear association between resource movement (reflected by changes in employment shares) and labor productivity for continuing or surviving firms. Furthermore, they find that there is no unique situation in which labor productivity specifically increases in more-productive firms or, the opposite, labor productivity decreases in less-productive firms. The study finds that increases in labor productivity take place at the less-productive firms and also the more-productive firms during the

base period. However, decreases in labor productivity also occur in the less and more productive firms.

In the context of Indonesia, Aswicahyono and Kartika observe a change in the source of employment growth throughout several periods. Aswicahyono and Kartika find that a pre-crisis (1975-1995) rapid improvement in labor productivity reduced labor requirements considerably. A reduction in (potential) employment opportunities was due to productivity improvements, However it is more than compensated by the rapid creation of employment opportunities due to the rapid growth of output. On average, during 1975-1995, output growth stimulated employment at nearly twice the reduction rate of employment due to labor productivity improvements.

Their study also suggests that a slowdown in labor productivity improvements during 1980-1985 coincided with the late import substitution period of 1980-1985. It can be concluded in general that prior to the crisis, through rapid investment growth, Indonesia was able to marshal massive employment creation and improve the well being of workers through productivity improvement.

Table 1. Source of Employment Growth in 1990-1995 by Sector

	dL	Qda	adQ	dD	dE	dIS	dIO
1 - Agriculture	2,033,965	(12,305,524)	14,339,489	21,730,284	3,978,875	(6,360,472)	(5,009,198)
2 - Mining	183,044	(116,588)	299,632	425,571	100,246	(114,931)	(111,254)
3 - Manufacturing	3,125,276	(3,278,829)	6,404,105	6,387,779	1,620,089	(2,234,519)	630,755
4 - Construction	896,037	(1,079,261)	1,975,298	1,888,247	21,280	(23,803)	89,574
5 - Wholesale & retail trade	3,502,454	(4,886,024)	8,388,478	7,342,485	1,423,586	(663,364)	285,771
6 - Transport & communication	1,205,761	(472,427)	1,678,188	1,127,076	554,911	(630,778)	626,980
7 - Other Activities	2,046,800	(7,048,546)	9,095,346	7,283,033	780,674	(998,075)	2,029,715
	12,993,337	(29,187,200)	42,180,537	46,184,474	8,479,661	(11,025,941)	(1,457,656)
1 - Agriculture	100	605	(705)	(1,068)	(196)	313	246
2 - Mining	100	(64)	164	232	55	(63)	(61)
3 - Manufacturing	100	(105)	205	204	52	(71)	20
4 - Construction	100	(120)	220	211	2	(3)	10
5 - Wholesale & retail trade	100	(140)	240	210	41	(19)	8
6 - Transport & communication	100	(39)	139	93	46	(52)	52
7 - Other Activities	100	(344)	444	356	38	(49)	99
	100	(225)	325	355	65	(85)	(11)

Table 2. Source of Employment Growth in 1995-2000 by Sector

	dL	Qda	adQ	dD	dE	dIS	dIO
1 - Agriculture	(68,446)	1,189,275	(1,257,721)	(2,080,469)	7,614,228	(2,804,603)	(3,986,877)
2 - Mining	33,636	(4,732)	38,368	(195,514)	177,631	(87,764)	144,015
3 - Manufacturing	153,218	(1,221,026)	1,374,244	(1,518,712)	3,495,152	(700,490)	98,293
4 - Construction	415,175	1,297,050	(881,875)	(868,016)	37,211	(24,136)	(26,934)
5 - Wholesale & retail trade	3,685,833	3,424,758	261,075	(3,880,655)	1,529,352	(713,500)	3,325,878
6 - Transport & communication	1,097,073	507,626	589,447	164,304	666,117	(530,190)	289,217
7 - Other Activities	733,245	2,252,447	(1,519,202)	(2,102,835)	759,265	(756,634)	581,002
	6,049,734	7,445,398	(1,395,664)	(10,481,897)	14,278,954	(5,617,316)	424,595
1 - Agriculture	(100)	1,738	(1,838)	(3,040)	11,124	(4,098)	(5,825)
2 - Mining	100	(14)	114	(581)	528	(261)	428
3 - Manufacturing	100	(797)	897	(991)	2,281	(457)	64
4 - Construction	100	312	(212)	(209)	9	(6)	(6)
5 - Wholesale & retail trade	100	93	7	(105)	41	(19)	90
6 - Transport & communication	100	46	54	15	61	(48)	26
7 - Other Activities	100	307	(207)	(287)	104	(103)	79
	100	123	(23)	(173)	236	(93)	7

Source: Aswicayono and Kartika 2009.

Note dL: The change in employment Qda is the output multiplied by the change in labour requirement per unit of output; adQ is the labour requirement per unit output multiplied by the change in output; dD is the change in demand; dE is the change in export; dIS is the change in import substitution and dIO is the change in input-output.

Moreover, employment induced by domestic demand was the main source of employment prior to the crisis. The effects of a large market and increased purchasing power, due to rapid economic growth produced this result. Third, employment created by exporting during the export boom period 1985-1995 more than doubled that of the import substitution period (1975-1985). Improvement in productivity was also better during the export boom period.

The pattern has been different since the 1998 economic crisis. First, the source of employment growth was mainly declining productivity, while output expansion contributed negatively to employment creation. Therefore, the economy ended up with fewer jobs and lower productivity. Manufacturing and mining are the exception but were responsible for a lower level of employment creation (Table 2). Second, domestic

demand expansion was no longer the main source of employment, replaced by export induced employment (Aswicahyono and Kartika 2009).

The paper finds that the impact of greater productivity on employment is ambiguous. An increase in productivity allows firms to absorb fewer workers, which, in turn, decreases the level of employment. However, an increase in productivity will lead to an expansion in firm productivity, that is, by using the same resources; the output produced will be larger than before. Higher output will enable firms to expand production and use more resources, including labor. In this channel, a higher level of productivity leads to more absorption in employment. Recent research supports the latter view.

In regard to the decomposition of productivity, large empirical studies focus on total factor productivity (TFP) growth. One study was done by Sjoholm (1997). Using detailed micro data from Indonesian manufacturing industries for the years 1980 and 1991, he calculated each firm's value added growth, labor growth, a proxy for capital growth (which is investment per output) export share of output, and share of imports in intermediate inputs. He then regressed the growth of value added on the remaining variables.[1] His study suggests that participation in international trade, especially through exporting, does have a positive impact on firms' TFP growth.

In the same vein Aswicahyono's study also undertakes research on the sources of TFP growth (Aswicahyono 2000). His study finds that the growth of demand, whether from export expansion or import substitution, leads to a positive result for TFP growth. The strong positive sign of the growth of demand, regardless of the source of growth, indicates the importance of economies of scale. Since economies of scale are one of the components of TFP growth, we may see a positive association between the growth of demand and TFP growth (Verdoorn's Law). Moreover, he also finds that there is no significant advantage for an import substitution strategy relative to an export expansion strategy. His study concludes that an export expansion strategy is more conducive to TFP growth than an import strategy.

[1] It should be noted here that even though the dependent variable is value added growth, the inclusion of labour and capital growth as the independent variables make it equivalent to the productivity studies.

Interestingly, according to his study, competition does create a positive environment for TFP growth. In addition, ownership has no effect on TFP growth. He finds that government and foreign ownership variables give an insignificant result. Yet he cautiously argues that it is uncertain whether the insignificant result is due to the fact that ownership has no effect on TFP growth, or to the inaccuracy of the measurement of ownership.

Two previous studies on productivity are based on aggregate data and hence depict aggregate industry dynamics. More recent papers provide firm level analysis and provide a more detailed firm level dynamic. Earlier studies on firm dynamics show considerable evidence of firms 'graduating' to larger size groups. (Aswicahyono *et al.*, 2008). The analysis was made possible by the fact that each firm in the annual survey is identified by a consistent designated code that enables it to be traced over time. The results of the study dispel the common populist view at the time that the declining share of small firms is a sign that these firms were being pushed out in the process of the rapid industrialization. Instead, the declining share of small firms can be interpreted positively that they were vacating the smaller size groups and graduating to larger groupings.

Aswicahyono *et al.* (2008) repeat the exercise until the year 2005. They find that there is little change in the size share based on current size, with the share of small firms rising slightly pre-crisis, then falling somewhat, while the largest firms were most affected by the economic crisis. However, based on size in the initial year, the small firm's shares rose quite quickly up until the crisis, but then began to decline from 2001. Based on this finding they conclude that the crisis and its immediate aftermath have changed the characteristics of firm mobility.

Table 3. Current and Initial Size

	Current Size (% VA)				Initial Size (% VA)		
	Small L=20-99	Medium L=100-499	Large L=500-		Small L=20-99	Medium L=100-499	Large L=500-
1990	7	27	66	1990	7	27	66
1991	6	28	66	1991	7	28	65
1992	7	28	64	1992	10	31	59
1993	7	23	70	1993	10	31	58
1994	7	23	70	1994	11	29	60
1995	7	22	71	1995	13	29	59
1996	7	21	73	1996	12	31	57
1997	8	27	65	1997	14	38	48
1998	8	24	68	1998	14	32	54
1999	7	25	68	1999	12	33	54
2000	7	24	68	2000	13	31	56
2001	9	24	68	2001	15	31	54
2002	7	24	69	2002	13	31	56
2003	6	23	70	2003	13	31	56
2004	6	25	69	2004	13	32	55
2005	5	25	70	2005	12	33	55

Source: Statistik Industri (SI), various years.

Until the crisis, smaller firms continued to display the dynamism evident in the pre-crisis period. However, after the crisis, the pace of graduation slowed, and the small firms' share in both series based on current and on initial size, declined. There are three possibilities why the behavior changed: (i) it could simply reflect a longer term process of industrial consolidation. (ii) It could indicate that smaller firms experienced greater adjustment difficulties or (iii) the increased competitive pressures that resulted as firms fought to survive. The paper hypothesized that the slowing down of the pace of graduation might be because the barriers for smaller firms increasing their scale have risen since the crisis, particularly in gaining access to finance. The argument is that banks have more difficulty differentiating between 'good' and 'bad' loan applicants after the crisis and, as a result, banks are more likely to adopt more stringent lending policies which favor those who were able to provide more collateral and/or an established credit history. (Stiglitz and Weiss, 1981)

The Aswicahyono *et al.* (2008) paper calculates the transition matrices and gives further evidence that the speed of firm mobility slowed after the crisis. During 1992-1996, 90.6% of the firms that were small at the beginning of the period had still not shown any signs of growth at the end of the period. For the remaining balance of the small companies, 8.8% and 0.6% had graduated to the medium and large groups respectively. During 2001-2004, a larger proportion (96.1%) remains small and a smaller percentage has graduated to the medium (3.7%) and the large group (0.1%). A clear result over the two sub-periods is that there is less mobility: more small firms remained small after the crisis as compared to before it. A similar conclusion holds for the medium sized firms.

Table 4.a. Distribution of Plants (% Total Plants), 1992 and 1996

		1996		
		S=20-99	M=100-499	L=500+
1992	S=20-99	90.6	8.8	0.6
	M=100-499	13.1	75.4	11.5
	L=500+	1.9	13.1	85.1

Table 4.b. Distribution of Plants (% Total Plants), 2001 and 2004

		2004		
		S=20-99	M=100-499	L=500+
2001	S=20-99	96.1	3.7	0.1
	M=100-499	10.9	84.3	4.8
	L=500+	0.9	11.8	87.3

Source: Statistik Industri (SI), 1992, 1996, 2001, and 2004.

3. Data and Methodology

3.1. Indonesian Manufacturing Data

The data for the Indonesian manufacturing industries are documented by the Indonesian Central Bureau of Statistics (Badan Pusat Statistik, BPS). With some modification to suit Indonesian conditions, BPS uses the International Standard

Industrial Classification (ISIC) for all economic activities. The Indonesian Census of Manufacturing is part of a decennial Economic Census, while the Survey of Large and Medium Scale Manufacturing is conducted annually in intercensal years, aimed (not always successfully) at the complete coverage of all establishments with 20 or more workers. Depending on the year, there are up to 160 variables including firm identification, sector classification, type of ownership, exports, and input and output variables. The aggregate data at the five- digit ISIC level are available in a published summary form in Statistik Industri (SI), while the firm level data can be obtained from BPS in electronic form.

The census and survey data attempt to cover all establishments with twenty or more workers. In 1985 BPS changed field procedures and improved them further in 1988 and 1990. Before 1985, field procedures were deficient in identifying new establishments and merely replaced establishments that ceased operation so that the number of firms between 1975 and 1985 remained more or less constant. The new field procedures were conducted through a door-to-door enumeration. As a result, the number of establishments showed a sharp increase in 1985, 1988 and 1990. Realizing the majority of establishments had started before they were included in the annual survey, BPS decided to correct this under-coverage by 'back casting' the history of establishments that were discovered after entry. The variables that were back casted are output, value added and total number of workers.

The biggest impact of the back cast was on the number of establishments, with employment less affected, and nominal value added .even less. This pattern occurs because most of the under-enumerated back cast establishments were smaller in terms of employment and value added per worker. In terms of trends, the growth in the number of establishments and employment in the back cast series was far smoother than in the SI data. However, the value added trend remained more or less the same.

The discussion of the data sources above draws attention to the fact that there are two data sources - the SI data and the back cast series. The SI data are superior in terms of the variables they covered but showed apparent under-coverage. On the other hand, the back cast data cover all firms in the manufacturing sector but only report four variables, output, intermediate input, value added and number of workers. The under-coverage in the SI data suggests any analysis that uses this sample, pre and post 1985,

may be misleading. This is especially relevant to an examination of the effects of the trade reform during the 1980s. Hence, with these data flaws, it will be more difficult to test whether changes in the 1980s are due to trade reform or to the altered sample size of the industry database.

Another complication of using Indonesian manufacturing industry data is the changes in the ISIC code. From 1975-1990 there were 119 industries (ISIC rev1), from 1991-1999. There were 286 industries (ISIC rev2). In 2000, BPS changed the classification into ISIC rev 3 with around 300 industries.

3.2. Methodology

This section extends the analysis of firm-level dynamics by examining several additional aspects: the patterns of firm-level entries and exits, and the rates of expansion and contraction for 'surviving' firms. We will undertake this analysis by tracking the history of each firm enumerated in the survey. An earlier study by Narjoko (2006) examined these patterns in the pre-crisis and crisis periods. This analysis extends the examination through to 2006, by which time manufacturing output had returned to pre-crisis levels and was growing moderately. We will employ three periods of analysis. First is the period of trade liberalization in the pre 1997/98 crisis period (1990-1996), second is the post rapid growth and crisis period (1996-2000) and third is the post-crisis period (2000-2006).

Our study, moreover, disaggregates the analysis into two key features indicating globalization. First, we analyze the decomposition based on the firm's ownership (foreign or domestic ownership). The second feature is output markets (i.e. export or domestic). By disaggregating firms by these features, we can try to understand whether there are significant differences in the source of employment, output and productivity between firms with low-exposure to globalization, illustrated by domestic ownership and domestic market oriented, and high-exposure firms, namely, foreign firms and export-oriented ones. Another important novel point of this analysis is how these variables (employment, output and productivity) in these two types of firms differ across the periods.

The analysis is expected to shed light on the main sources of production, employment and productivity. In regard to the source of production, the benchmark of

our estimation strategy is the Bernard *et al.,* methodology which decomposes the sources of US economic growth (Bertnard *et al.,* 2006). Regarding the source of employment, our estimation strategy employs a job decomposition framework. Furthermore, on productivity we will employ Foster *et al.* (2001). The detailed estimation can be described as follows:

The Decomposition of Output

Bernard *et al.*, classifies firms into three categories. 1) firms producing products at time *t* and *t-5* (called "incumbents"), 2) surviving firms which have no production at time *t-5* yet produce at time t (called "adders"), 3) firms which exist only at time *t* ("new entrants"). Subscript *p* refers to the output index, B_{tp}, A_{tp} and N_{tp} are sets of incumbents, adders, and new entrant firms respectively.

$$Y_{tp} = \sum_{j \in B_{tp}} Y_{tpj} + \sum_{j \in A_{tp}} Y_{tpj} + \sum_{j \in N_{tp}} Y_{tpj} \qquad (1)$$

On the other hand, any output reduction can be decomposed into the three categories of firms 1) the incumbents which decrease their production, 2) surviving firms producing at time *t* but not at *t+5* (called "droppers") and 3) firms exiting from the industry at time *t* and *t+5*. The estimation can be described as follows:

$$Y_{tp} = \sum_{j \in C_{tp}} Y_{tpj} + \sum_{j \in D_{tp}} Y_{tpj} + \sum_{j \in X_{tp}} Y_{tpj} \qquad (2)$$

C_{tp}, D_{tp} and X_{tp} refer to the sets of incumbents, droppers and exiting firms respectively.

The Decomposition of Employment

The estimation of employment decomposition can be described as follows:

$$\Delta L = \sum_{e \in N} L_t^e + \sum_{e \in C} (L_t^e - L_{t-5}^e) - \sum_{e \in X} L_{t-5}^e \qquad (3)$$

The equation above describes the net change of employment derived from three terms. The first term captures job creation from new-entrant firms. The second illustrates the changes of employment size within surviving firms. The last term exhibits job creation due to exiting firms.

As equation 3 does not provide details about job reallocation within continuing firms, the equation can be decomposed into a further equation as follows:

$$\Delta L = \left[\sum_{e\in N} L_t^e - \sum_{e\in X} L_{t-5}^e\right]_1 + \sum_{e\in C}\left[\frac{L_{t-5}^e}{Q_{t-5}^i}\cdot\left(Q_t^e - Q_{t-5}^e\right)\right]_2 + \sum_{e\in C}\left[Q_{t-5}^e\cdot\left(\frac{L_t^e}{Q_t^e} - \frac{L_{t-5}^e}{Q_{t-5}^e}\right)\right]_3 + \sum_{e\in C}\left[\left(\frac{L_t^e}{Q_t^e} - \frac{L_{t-5}^e}{Q_{t-5}^e}\right)\cdot\left(Q_t^e - Q_{t-5}^e\right)\right]_4 \quad (4)$$

Equation 4 exhibits several key points. First, as labor demand would depend on the state of output (i.e. increases in labor demand are due to output expansion), it is important to put output-based weight on the employment level at each plant. Bracket 2, 3, and 4 represent the relative labor demand weighted by output level on each continuing/surviving plant. The first bracket shows the change of employment due to entry-exit firms. The second bracket describes the relative labor change due to the change in output at the continuing firms. In other words, it illustrates the change of employment in regard to output expansion or contraction. The third bracket suggests an own-effect of labor demand The last bracket is the cross-term effect of labor demand.

The Decomposition of Productivity

We follow Foster *et al.*,'s approach (as quoted from Hayakawa *et al.*, 2009).

$$\Delta A_{it} = \underbrace{\left[\sum_{e\in C} s_{et-1}\Delta A_{et} + \sum_{e\in C}\left(A_{et-1} - A_{it-1}\right)\Delta s_{et} + \sum_{e\in C}\Delta s_{et}\Delta A_{et}\right]}_{Continuing\ firms} + \underbrace{\left[\sum_{e\in N} s_{et}\left(A_{et} - A_{it-1}\right)\right]}_{Entry\ firms} - \underbrace{\left[\sum_{e\in X} s_{et-1}\left(A_{et-1} - A_{it-1}\right)\right]}_{Exiting\ firms}, \quad (5)$$

A_{it} refers to productivity (labor productivity) in industry *i* at time *t*. e is plant index. *S* is share of a plant in the industry in terms of output/inputs. *C, N, X* are continuing plants, entry plants and exiting plant respectively.

Similar to equation 4, equation 5 impinges on several important points. First, as noted by Hayakawa, Kimura and Machikita, there is a need to impose output-based weight on labor productivity as we aggregate each firm's productivity. Another issue is the importance of distinguishing between the reallocation effect and own effect in productivity growth. The reallocation effect represents the productivity growth affected by the expansion of more productive plants relative to less-productive firms. The own effect tells us about the productivity growth at each firm. The own effect is captured by the first term of the first bracket. The reallocation effect is exhibited by the second term and the last term of the first bracket, that is the cross-term. The second and third brackets describe the productivity differential between the new-entrant and exiting firms.

4. Result

4.1. Entry and Exit

This section further discusses the response of firms to such change utilizing a micro dataset. We analyze dynamics at the firm level by utilizing the entry and exit rate of firms and output decomposition. Moreover, we look into three major periods: 1) Pre-crisis period (1990-1996), 2) crisis and recovery period (1996-2000), and 3) post-crisis period (2000-2006). We also separate our analysis into two major categories: 1 ownership (foreign or non foreign ownership) and 2 market orientation (export or domestic).

In regard to firm entry and exit, we found that the entry of new firms was far higher than the exit of firms in the pre-crisis period. Moreover, high entry firms largely came from wood and wood products, chemical products, non-metallic mineral products, and fabricated metal products (ISIC 33, 35, 36, and 38) in which their number was almost double that of the exit firms of the respective sectors. The trend was reversed in the

crisis-recovery period (1996-2000), where exiting firms exceeded new entrants. Exiting firms surpassing new entrants occurred in nearly all of the sectors. Yet they were most significant in non-metallic mineral products. Surprisingly, though the number of entry firms that produced wood and wood products declined significantly. The number of, exiting firms also declined slightly during 1996-2000. In other words, we did not see a dramatic change in firm-level dynamics in the industry. After the crisis (2000-2006), we observed that new entrant firms reached higher levels than that of the pre-crisis period and firms were more dynamic than they were before the crisis. The main driver was largely the food and beverages, textiles and paper products industries (ISIC 31, 32 and 34).

Table 5. The Number of Firms

Manuf.	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	9,707	12,814	6,466	16,055
1996-2000	16,496	4,875	6,025	15,346
2000-2006	12,416	15,503	8,954	18,965
Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	1,827	2,459	629	3,657
1996-2000	2,641	890	728	2,803
2000-2006	2,459	2,463	1,301	3,621
Non-Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	7,880	10,355	5,837	12,398
1996-2000	13,855	3,985	5,297	12,543
2000-2006	9,957	13,040	7,653	15,344
FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	469	669	1,982	(844)
1996-2000	1,113	535	154	1,494
2000-2006	1,068	846	585	1,329
Non-FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	9,238	12,145	4,484	16,899
1996-2000	15,383	4,340	5,871	13,852
2000-2006	11,348	14,657	8,369	17,636

Source: Authors' calculation.

Concerning entry and exit by ownership, we found data that puzzled us. Before the crisis, the number of exiting firms owned by foreign companies was higher than the new-entrants. There were a significant number of firms that exited in food and beverages, wood products and paper products. However, the level of new firms entering overtook the level of exiting firms during the period of the crisis and afterwards. On the other hand, there was no significantly different pattern of firm dynamics in the domestic firms.

Regarding the output market orientation, we saw that the number of new entrant firms with export markets was higher than exiting firms during all of the period. The number declined during the crisis but the level of new entrants returned to pre-crisis level. The story is somewhat different to non-export firms, which followed the general pattern of manufacturing dynamism. Interestingly the level of new entrant firms was slightly higher in the post-crisis period than that of in the pre-crisis period.

4.2. Decomposition of Output

As we decomposed the sources of output, we observed that high output during the pre-crisis period was driven significantly by the existing firms. The wood, chemical, basic metal and fabricated metal products industries (ISIC 33, 35, 37 and 38) were the leading sectors that boosted manufacturing output in 1990-1996. Yet the trend reversed in the 1996-2000 period where the source of manufacturing output growth was new entrants. The wood and basic metal industries were sectors which contributed considerably to the growth in manufacturing output. As the economy recovered, the output of existing firms increased significantly yet the level was still lower than that of in the pre-crisis level.

Table 6. Decomposition of Output

Manuf.	Incumbent	New-Entrant	Exiting	Total
1990-1996	26,763	12,688	2,472	36,979
1996-2000	1,892	7,025	3,739	5,178
2000-2006	18,802	15,589	17,856	16,534
Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	18,480	7,962	557	25,886
1996-2000	2,067	3,674	2,113	3,628
2000-2006	11,961	6,918	6,268	12,611
Non-Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	8,283	4,725	1,914	11,093
1996-2000	(175)	3,351	1,626	1,550
2000-2006	6,840	8,671	11,589	3,923
FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	7,024	4,547	1,954	9,616
1996-2000	5,479	4,343	1,262	8,561
2000-2006	8,148	6,334	8,192	6,290
Non-FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	19,739	8,141	518	27,362
1996-2000	(3,587)	2,682	2,477	(3,382)
2000-2006	10,653	9,254	9,664	10,244

Source: Authors' calculation.

Moreover, the pattern of each classification does not show a significant difference to the manufacturing pattern in general, yet, some are worth mentioning. In the post-crisis period, the source of output growth in non-export firms was mainly new-entrant firms. The level of output growth from the new-entrants in the post-crisis-period (2000-2006) was almost double that in the pre-crisis period (1990-1996). At the same time, the output of the existing firms did not return to the pre-crisis period level and it was even lower than that of the new-entrants. It seems to suggest that output in the post-crisis period was mostly driven by the use of new resources rather than the reallocation of resources within the firms. Another interesting figure is that the output level of

foreign firms was slightly higher than that of in the pre-crisis period-while the general manufacturing output level in the post-crisis period did return to the pre-crisis level.

4.3. Decomposition of Labor

Table 7 shows the pattern of employment creation during the pre -crisis, crisis, and post-crisis period. First, in general we observe similarities in the pattern: employment creation came mainly from net-entry and continuing firms, while a change in the labor coefficient and the interaction term contribute negatively to employment creation. This is a positive indicator of economic development, in which a new labor force is employed by new entry and the expansion of existing firms. Productivity improvements, on the other hand, reduce labor requirements per unit of output and hence contribute negatively to employment creation. However, even though increased productivity reduces labor requirements, increased productivity also reduces the cost of production. This in turn may induce a larger scale of production, which in turn creates job opportunities. The worrying sign is that during the post crisis period, the ability of the manufacturing sector, especially the contribution of continuing firms, to absorb labor has been reduced considerably,

Table 7. Decomposition of Labor

Manuf.	Net Entry	Continuing	Change in Labor Coeff	Interaction Term	Total
1990-1996	90,951	3,468,421	(749,220)	(2,181,453)	628,699
1996-2000	41,249	404,920	(12,123)	(325,490)	108,557
2000-2006	224,939	1,243,324	(498,235)	(697,057)	272,972
FDI	**Net Entry**	**Continuing**	**Change in Labor Coeff**	**Interaction Term**	**Total**
1990-1996	(40,063)	610,735	(96,064)	(403,547)	71,062
1996-2000	82,186	220,257	(97,973)	(59,911)	144,559
2000-2006	74,847	251,473	(62,132)	(115,707)	148,480
Non-FDI	**Net Entry**	**Continuing**	**Change in Labor Coeff**	**Interaction Term**	**Total**
1990-1996	131,014	2,857,685	(653,156)	(1,777,906)	557,637
1996-2000	(40,937)	184,663	85,851	(265,579)	(36,002)
2000-2006	150,092	991,851	(436,102)	(581,349)	124,492
Export	**Net Entry**	**Continuing**	**Change in Labor Coeff**	**Interaction Term**	**Total**
1990-1996	654,394	1,566,336	(446,897)	(762,360)	1,011,473
1996-2000	26,970	98,223	155,032	(102,447)	177,778
2000-2006	116,965	549,003	(143,781)	(357,349)	164,838
Non-Export	**Net Entry**	**Continuing**	**Change in Labor Coeff**	**Interaction Term**	**Total**
1990-1996	290,759	1,207,409	(250,081)	(776,659)	471,428
1996-2000	14,279	440,780	(299,883)	(224,397)	(69,221)
2000-2006	107,974	521,088	(294,127)	(226,802)	108,134

Source: Authors' calculation.

As expected, the exporting firms consistently provide more jobs than the non-exporting firms. Interestingly, prior to the crisis, non-FDI firms created many more jobs compared to of FDI firms. The situation was reversed post crisis with FDI firms creating more jobs than non-FDI. Another salient feature is that both FDI and exporting firms can withstand a crisis better than the non-FDI, non-exporting firms.

4.4. Decomposition of Labor Productivity

Table 8 shows the pattern of labor productivity change during the pre- crisis, crisis, and post-crisis periods. Again, we observe a sharp drop in productivity gains post-crisis

compared to the pre crisis period. However, the sharp drop mostly occurs in non-FDI. In contrast, the contribution of FDI to manufacturing productivity is consistently increasing throughout the periods. Another salient feature is that during the crisis FDI firms show an improvement in productivity. In contrast, the non-FDI firms experience large productivity losses.

Table 8. Decomposition of Labor Productivity

Manuf.	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	21,948	37,287	11,007	48,228
1996-2000	(8,669)	6,762	10,044	(11,951)
2000-2006	6,401	13,779	10,945	9,235
FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	715	7,070	9,943	(2,158)
1996-2000	4,900	12,583	6,031	11,452
2000-2006	3,656	10,248	10,363	3,540
Non-FDI	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	24,045	33,670	(117)	57,832
1996-2000	(12,906)	(3,367)	4,594	(20,866)
2000-2006	3,418	8,372	4,962	6,828
Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	24,613	35,842	9,971	50,483
1996-2000	1,134	6,559	12,240	(4,547)
2000-2006	6,605	11,481	8,415	9,671
Non-Export	**Incumbent**	**New-Entrant**	**Exiting**	**Total**
1990-1996	2,756	7,545	4,058	6,243
1996-2000	(5,977)	2,741	820	(4,056)
2000-2006	1,865	3,962	3,152	2,675

Source: Authors' calculation.

Exporting and non-exporting firms exhibit similar patterns. Both show large positive productivity gains prior to the crisis, but experience a loss of productivity during the crisis, and regain productivity, with a smaller magnitude post-crisis. However, during the crisis, in the case of exporting firms, it was bankruptcy that

contributed negatively to aggregate labor productivity. In contrast, in the case of non-exporting firms, the decline of the productivity of incumbent firms was the major source of lost productivity.

5. Why Employment Grew Slowly

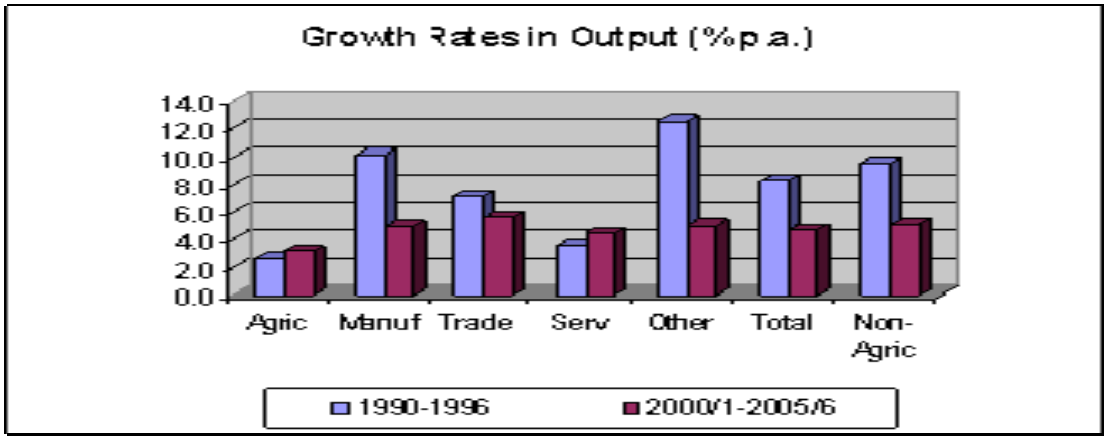
This subsection attempts to answer the question of why employment performance did not improve significantly amid strong economic growth during the recovery period. With regard to this, we identify at two domestic issues explaining low employment growth: 1) slow output growth in traditional labor-intensive industries, and 2) Stringent labor policies.

5.1. Slow Output Growth in Traditional Labor-intensive Industries

Why was the unemployment rate stubbornly high even though the economy still grew steadily? Some observers link the problem to the decelerating trend in the output growth of traditionally labor-intensive sectors, particularly the manufacturing sector (Manning 2008). This relationship, namely, the relationship between employment and output essentially relies on microeconomic theory suggesting that demand for the labor of profit maximizing firms will be at the point where the value of marginal productivity of labor is equal to the real wage rate. This shows that, assuming technology is constant, in the short-run; changes in employment are mainly due to changes in output. In this context, slow output growth of manufacturing would lower its rate in creating employment opportunities.

Figure 1 illustrates the general trend of output growth by sectors. It shows that the output growth of the agricultural and service sectors in the post-crisis period was higher than the pre-crisis period. However, the output growth of the manufacturing and trade sectors was not back to the pre-crisis levels yet. Some studies suggest that the economic crisis has changed the compositional contribution of sectors to GDP. Indeed, Aswicahyono *et al.* (2008) argue that there is a major shift in the composition of GDP, where industry is no longer the leading sector it was.

Figure 1. Growth Rates in Output



Source: Manning (2008).

Even though the trends within manufacturing vary from one industry to another due to the economic crisis, some sectors nevertheless are worth noticing, especially labor-intensive industries. During the crisis, many sub-sectors in manufacturing experienced a significant contraction (see **Table 9**). Textiles, clothes and leather industries (TCL) which are responsible for creating large employment opportunities declined by -3.4 % during the crisis. The wood and wood products industry suffered a significant loss by shrinking by -14% during the same period. Some signs of recovery occurred in the 2000-2002 period however, their growth has been slow in recent years.

Table 9. Output Growth and Shares of Manufacturing

Growth		1994-96	1997-99	2000-02	2003-06
31	Food, Beverages, and tobacco	17.5	5.6	1.6	3.5
32	**Textile, clothes and leather Ind.**	**8.7**	**-3.4**	**4.9**	**3.2**
33	**Wood and wood products**	**4.0**	**-14.0**	**2.7**	**-0.6**
34	**Paper and paper products**	**11.4**	**2.2**	**1.0**	**5.1**
35	Chemical and chemical products	10.7	-0.8	4.1	8.2
36	Non metallic mineral products	16.9	-7.0	10.4	5.2
37	Basic metal industries	11.1	-9.2	3.6	-2.4
38	Fab. metal, machine, and eq.	7.3	-21.2	26.3	11.6
39	Other manuf. Ind.	10.3	-10.2	4.8	9.2
Non-oil and Gas Manufacturing		**10.5**	**-6.3**	**7.4**	**6.2**

Growth		1993	1999	2002	2006
31	Food, Beverages, and tobacco	20.7	36.5	30.9	27.9
32	**Textile, clothes and leather Ind.**	**13.4**	**14.2**	**13.2**	**11.8**
33	**Wood and wood products**	**9.8**	**6.4**	**5.6**	**4.3**
34	**Paper and paper products**	**4.8**	**6.6**	**5.5**	**5.2**
35	Chemical and chemical products	11.2	13.5	12.3	13.3
36	Non metallic mineral products	2.9	3.2	3.5	3.4
37	Basic metal industries	3.0	2.7	2.4	1.7
38	Fab. metal, machine, and eq.	33.3	16.1	25.9	31.5
39	Other manuf. Ind.	1.0	0.8	0.8	0.8
Non-oil and Gas Manufacturing		**100.0**	**100.0**	**100.0**	**100.0**

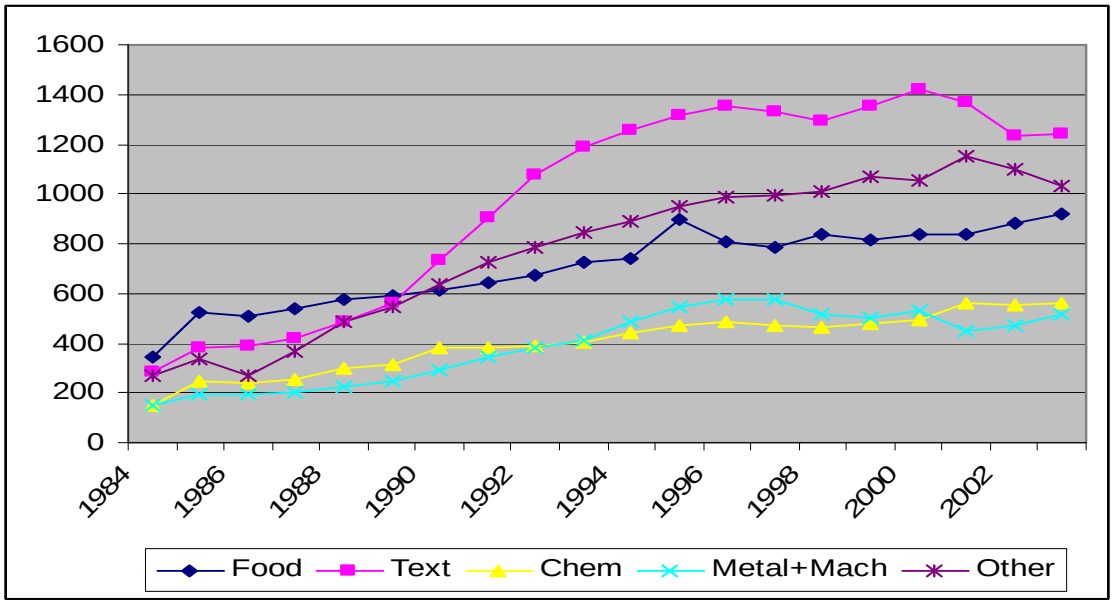
Source: Aswicahyono *et al.* (2008).

In addition, comparing trends between the pre-crisis and the post-crisis periods (2000-2006), the output growth of food, TCL, and wood sectors had not returned to the pre-crisis level. By 2003-2006, textiles, cloth and leather industries (TCL) grew slower (3.2%) than during the pre-crisis period (8.7% in the 1994-1996). Food, beverages and tobacco industries also experienced a similar slowdown in growth. Before the crisis, the sector grew at a strong pace, 17.5% between 1994 and 1996. During 2003-2006, it grew slower than the pre-crisis level, 3.5%. Meanwhile, the wood and wood products sector continued to lag by growing negatively, -0.3% between 2003 and 2006. The shortage of input supply was the main factor behind a decline in the growth of the wood sector. Furthermore, the chemicals sector grew quite steadily between 2003 and 2006 and was likely to continue to progress to the pre-crisis levels.

A recent troubling finding suggests that these sectors are no longer export growth engines (Aswicahyono *et al.*, 2008). Some recent surveys also suggest that non-tradable sectors, employing few workers, grew dramatically, whilst meanwhile the tradable sectors grew at a modest pace (Kong and Ramayandi 2008). These findings strongly support the argument of compositional shifting in GDP which is likely to have a serious effect on employment, particularly in the formal sector.

Figure 2, moreover, confirms that the sluggish output growths in textiles and food industries were followed by slow employment growth in these sectors. Manning notes that before the crisis, these sectors (textiles, chemicals and food products sectors) created about one-third of the jobs in manufacturing. Therefore, the poor performance of these sectors would significantly affect the overall employment growth in the manufacturing sector.

Figure 5. Employment in Major Sectors of Large & Medium Manufacturing 1984-2003



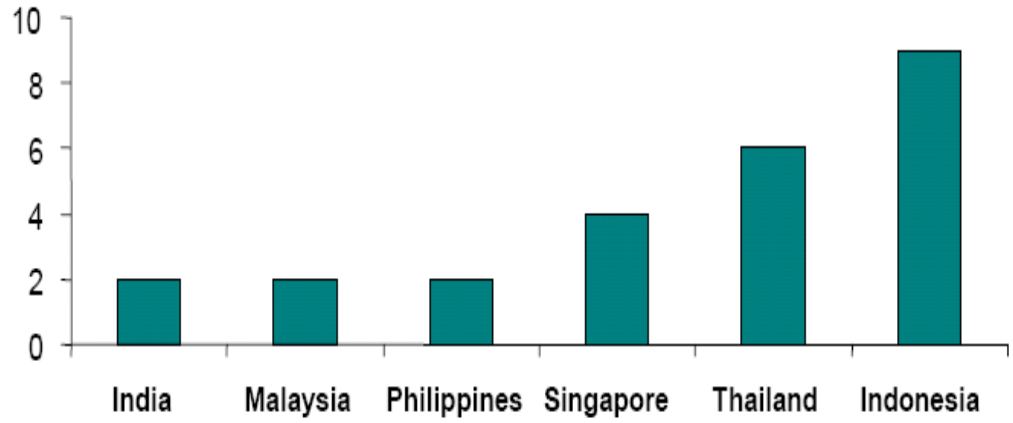
Source: Manning 2008.

5.2. Stringent Labor Policy: Manpower Law No 13/2003

Many studies also point out that the slower formal sector growth was connected to Manpower Law No 13/2003. Manning and Roesad (2007) excellently summarize the articles of manpower law No 13/2003 which are hurdles for employment growth in the formal sector, particularly articles about severance pay, sub-contracting and fixed-term contracts. Though sub-contracting and fixed-term contracts are the key controversial points of the Law, this article mainly will discuss severance pay and emphasize its impact on the growth of employment, particularly in the formal sector.

Some points, moreover, are worth noting regarding severance costs. First, in the regional context, increases in severance payments occurred in the period when they fell in many countries. These increases would have a backwash effect on the growth of employment particularly in the formal sector, considering the economy was not in a favorable condition as compared to other countries. Figure 8 shows clearly that severance pay for the dismissal of a worker with four years of experience due to economic reasons is quite high in Indonesia.

Figure 6. Severance Pay in Number of Monthly Wages for a Worker with 4-years Experience at a Firm and Dismissed for Economic Reasons



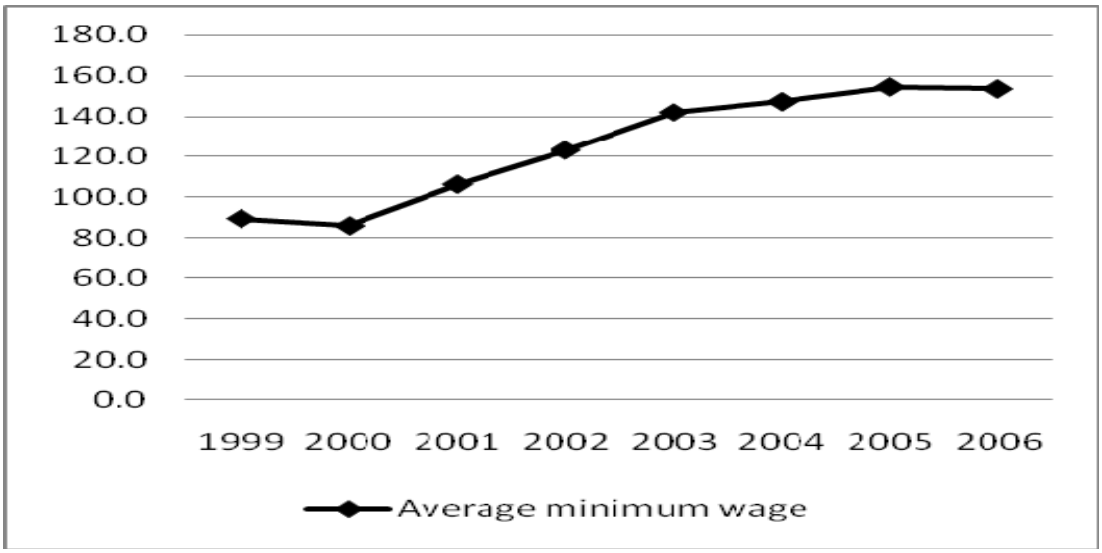
Source: GIAT-UNPAD 2004, quoted from Kelly Bird (2005).

Second, severance costs in real terms have increased dramatically, particularly in the period 2000-2003, and were mainly due to a dramatic increase in the minimum wage and at a time when the manufacturing sector was on the way to recovery (Manning and Roesad 2007). **Figure 7** shows that there is a sharp increase in the real minimum wage in the period 2000-2003. This sharp increase dramatically maintained the level of severance costs. Manning and Roesad show that during 2000-2003 severance costs skyrocketed by 170%. A rapid increase occurred in the Bandung area where severance costs rose by 250% and the main contribution of increases in severance costs was the real minimum wage.

Even so, this rapid increase does not necessarily occur in reality, first and foremost because of low compliance rates which are common in developing countries. Furthermore, some studies show a strong positive relationship between the minimum wage rates and non-compliance rates across developing countries. Bird shows that as the minimum wage rate relative to median wage rate rises, the number of wage workers earning below the minimum wage rate is increases (Bird 2005). He concludes that, comparing across developing countries, higher minimum wage rates are usually followed by a higher number of non-compliant firms.

Therefore, if the compliance rates are low, for example because of a weak enforcement mechanism, one may argue that the law would not lead to an improvement in welfare for those covered by the law (formal sectors) or there may even be a deterioration in welfare for those outside the formal sectors. Indeed, the Law may be irrelevant in regard to implying any welfare changes (Manning and Roesad 2007). In addition, since the coverage provided by the law is quite low, its impact on employment may be pretty small. However, the potential effect due to a stringent labor regime would contribute to the slower growth of employment in the formal sector.

Figure 9. Average Real Minimum Wage



Source: Depnakertrans.

Table 10. Rise in Real Severance Costs and Contribution of Increases in Severance Rates and Minimum Wage Rates, by Firm Location 2000-03

	Increase in real Minimum Wage	% of increase in severance costs due to rise in			
		Severance pay rate	Real minimum wage	Total	Increase in real severance costs 2000-03
Indonesia (Average)	47.5	49	51	100	170
Jakarta	65.2	41	59	100	203
Bandung	90.8	33	67	100	250
Surabaya	83.6	35	65	100	237

Source: Maning and Roesad (2007).

6. How Globalization Affects Indonesian Manufacturing: A Case Study of the Textile Industry

The textile industry has been an important sector, as it provides a large number of employment opportunities. However, it experiences strong pressure from international markets. Atje *et al.* (2008) reports that the Indonesian textile industry has faced a new international competitive environment. Some reasons for this are; the end of the WTO Agreement on Textiles and Clothing (ATC), the rapid growth in export of Chinese goods to the world, trade liberalization of the textiles, clothing and footwear (TCF) market in ASEAN, and the creation of preferential trade areas (PTAs).

Though the ATC ended in 2005; implying a freer market of textile trading Hassler (2004) argues that it might not be the case as some developed countries sill imposed various non-tariff barriers. Japan, for example, introduced a high import duty and Australia imposed a quota on garment importers. In Western Europe, some countries such as Sweden and Germany require eco-labeling standards for their imported goods (Hyvarinen 1997, cited in Hassler 2004). All of these trade measures definitely impede the competitiveness of developing countries' products.

Hassler furthermore notes that an implication of the end of ATC may be a lower demand for clothing suppliers (Hassler 2004). Atje *et al.* (2008) argue that it may impact Indonesia in at least two ways. First, large importing economies may import goods from geographically closer countries since the delivery cost in terms of nominal cost and time is lower than other exporting countries. It encourages North American and Western Europe neighboring countries such as Latin American and African countries, and is detrimental to the Asian countries. The second implication is that buyers would prefer to import from producers who are able to provide products and services related to all stages of production (Minor and Feeney 2006). The services which importers might require include designing, sample making, material and accessory sourcing, financing, and making up. This new type of demand from large importers would create new opportunities for Indonesia and other Asian countries in the region.

Another globalization effect is the role of China in the global market. The growing export market for Chinese goods has a considerable impact on emerging economies, including Indonesia. However, it seems that in the long run, China may upgrade its technological ladder, moving away from the labor-intensive manufacturing industries. In addition, using the Finger-Kreinin export similarity index, Athukorala suggests that goods from Indonesia, and other ASEAN countries, have low similarity to Chinese products in 2003. Nevertheless, it is noted that among the ASEAN countries, Indonesian products are the closest in similarity to Chinese products. This may imply that the effect of China's huge export expansion on Indonesian exports might be less harsh than expected although it could not be regarded as being negligible (Atje *et al.*, 2008).

In the context of liberalization in ASEAN and the creation of PTAs, the regional initiatives of the ASEAN Economic Community (AEC) might assist its member countries to prop up their competitive advantage in the textile industry. One of the AEC priority sectors is textiles and garments which is in line to be fully liberalized in the region by 2010. During the post-quota era, ASEAN was able to integrate its supply chain in order to serve large markets such as the US and the EU with a full range of services and products in textiles and product of textiles (TPT). All ASEAN countries are clothing manufacturers except Singapore and, to some extent, Malaysia (Minor and Feeney 2006). However, the opportunity lies in the fact that countries have different cost competitive advantages. Some are competitive in making up; others in yarn producing, fabric dying and finishing, and others are in logistics, design, and marketing. Therefore, a regional integrated supply chain would enable industries in the region to compete with other cheap-labor countries and thus strengthen its position in the international market.

Nevertheless, a few shortcomings of the ASEAN production network are; the low levels of intra-industry trade in the region, substantial exemptions from tariff elimination for some newcomers in the Association, and various goods and services' standards applied by member states. Minor and Feeney (2006) report that intra-industry trade in the ASEAN region is only around 10% of all ASEAN imports of yarn and fabric. Moreover, the member countries have agreed to eliminate tariffs by 2010 with a few exceptions, whereas the Philippines, Cambodia, and Vietnam have significant tariff

lines excluded from the agreement. Another shortcoming is that there are diverse standards of products ranging from low standards adopted by the least developed countries to high standards adopted by the most developed countries in the region. This could potentially hamper the free flow of goods and services in the region.

Therefore, initiatives should be taken to speed up the integration of the ASEAN production network in order to enhance the competitiveness of the region's industries in the global market. The initiatives are; promoting the elimination of tariffs, trade facilitation, customs improvement, and partnerships between ASEAN producers. An example of a partnership is suggested by Minor and Feeney (2006) which takes a form of geographic hubs between Malaysia, Singapore, and Thailand.

7. Conclusion and Policy Recommendation

Our study attempts to observe the sources of output, employment, and productivity over three periods, namely, 1) the pre-crisis period (1990-1996), 2) the crisis and recovery period (1996-2000), and 3) the post-crisis period (2000-2006). In order to capture the impact of globalization on Indonesia's manufacturing industry, our analysis is also classified by ownership (foreign investment and domestic), and market orientation (export or non export). Based on the decomposition method, we find that there are significant changes in the pattern of output, employment and labor productivity.

In regard to output, we find that high output during the pre-crisis period was driven significantly by the existing firms. Firms in the wood, chemical, basic metal and fabricated metal products industries (ISIC 33, 35, 37 and 38) were the leading sectors that boosted manufacturing output in 1990-1996. The trend, however, reversed in the 1996-2000 period where the source of manufacturing output came from new entrants. Moreover, there are no significant differences in terms of ownership and market orientation.

Concerning employment, we see that exporting firms consistently provide more jobs than the non-exporting firms. Interestingly, prior to the crisis, non-FDI firms

created many more jobs compared with FDI firms. The situation was reversed post crisis with FDI firms creating more jobs than non-FDI. Another salient feature is that both FDI and exporting firms were able to withstand the crisis better than the non-FDI, non exporting firms.

In the context of labor productivity, we observe a significant drop in non-FDI firms. In contrast, the contribution of FDI in manufacturing productivity is consistently increasing throughout the periods. The finding also reinforces the significant role of FDI in improving labor productivity over periods. The story is similar to exporting versus on exporting firms, where the labor productivity of exporting firms also improves throughout the period. Finally, we suggest several policy measures:

In order to encourage manufacturing output growth, the government needs to:

- Maintain macro-economic stability and coordination in the macroeconomic policy mix (fiscal & monetary policy). Macroeconomic stability, especially the interest rate and exchange rate, is necessary to support a better investment climate
- Increase investment in infrastructure support, especially in the improvement of energy resources and the improvement of the port management system in order to strengthen competitiveness.
- Create a business friendly environment through regulatory and bureaucratic reforms. In the decentralization context, this policy should be pursued by increasing coordination among government agencies horizontally and vertically as well as by controlling and abolishing unnecessary regulations, taxes and levies that have harmed economic activities.
- Provide market access information and trade facilitation as well as seeking new market destinations to increase exports. This can be pursued by intensifying and improving the effectiveness of joint government and industry approaches to market promotion, such as joint public-private participation in trade fairs, trade delegations, etc.
- Consider further involvement in preferential trade agreements with its export partners in order to avoid losses in its competitiveness with other countries since it is not involved in any preferential trade arrangement. However, persistent

support for multilateral trade agreements that facilitate global tariff reduction through the WTO framework should also be intensified.

Concerning labor issues, the government is expected to

- Reform labor-related regulations aimed at creating a more flexible labor market. The top priority of the reform should be severance payment regulations increasing by almost double in the period of recovery. Firms need to subcontract and outsource labor using permanent workers which will offer flexibility for adjusting input costs and coping with any shock in demand. This is particularly important in the labor-intensive industries.
- However, the government cannot simply impose a fully coherent reform, because this might be self-defeating. In a new democratic environment with strong labor unions, it is necessary that all stakeholders concerned (i.e. the government, employers and workers) should have an active part in the process.

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