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Quantitative Analysis of Indonesia's
Short and Long-term Development Strategies

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Quantitative Analysis of Indonesia's Short- and Long-term Development Strategies*

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Abstract: In this paper, we applied several quantitative economic analyses to identify the effective and efficient means to improve the Indonesian economy, with special focus on factors affecting growth mechanism, employment generation, and poverty reduction. Inter-provincial Input-Output analysis revealed that the most efficient way to promote growth nationwide is to stimulate the economies of Java and Sumatra. Considering the growth linkages and the employment generation effects, however, it is also of great importance to assist Kalimantan, Sulawesi and other parts of eastern Indonesia as well. Since there are some groups and regions left behind the growth and/or not sufficiently benefited from the growth, direct measures to alleviate poverty are also essential for such less-developed groups and regions. Thus, for sustainable and equitable growth in Indonesia, we proposed to adopt “*a double two-faceted strategy*”, in which “*two-faceted strategy by region*”, i.e., differential but simultaneous growth promotion for the west and east Indonesia, and “*two-faceted strategy of growth and poverty reduction*”, i.e., a simultaneous support for growth and poverty reduction, are pursued.

Keywords: Input-Output analysis; micro-econometric analysis; employment; poverty

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1 Introduction

Indonesia had achieved a high level of economic growth until it was hit by the Monetary Crisis in 1998. Poverty reduction had proceeded alongside this high growth. However, economic growth has slowed in the 10 years after the crisis, and correspondingly the pace of poverty alleviation has also slowed down. During this period, the unemployment rate rose from 4.7 percent in 1997 to 11.2 percent in 2005. The overall objective of this paper is to identify what kind of government intervention is effective for achieving the virtuous circle of high growth, high employment, and poverty reduction in Indonesia. Toward this goal, this paper explores factors contributing to the mechanism of economic growth, employment generation and poverty reduction, based on quantitative analyses using statistical data from Indonesia.

This paper comprises the five following sections. We analyze the growth mechanisms by regions in Section 2, and assess effective employment strategies in Section 3. In Section 4, we identify the characteristics of groups and regions not integrated into growth mechanisms, and examine effective forms of aid to improve the living standards of the poor. Section 5 provides a long-term economic outlook on the linkage between growth and employment under several hypothetical scenarios. Section 6 concludes with policy implications.

2 Growth Mechanisms Viewed from a Regional Input-Output Structure

The aims of this section are to identify regions and sectors where the effects of growth are pronounced and to seek out growth strategies by region while focusing on the geographic distribution of domestic industry and inter-regional/provincial and inter-industrial transactions. The analyses in this section rely mainly on the inter-provincial input-output tables for 35 industries in 2005 obtained from BAPPENAS¹, Gross Regional Domestic Production in 2003 published by BPS, and large and medium industry statistics in 2005 prepared by BPS.

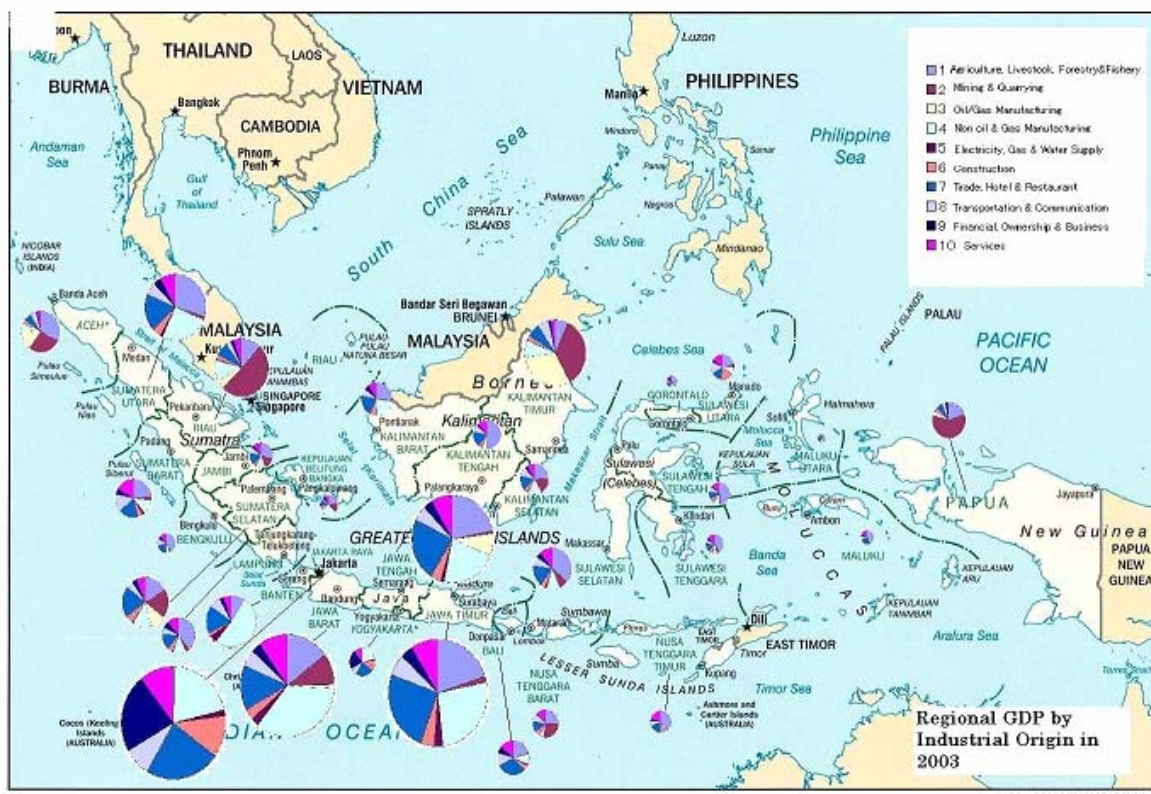
2.1 Gross Regional Domestic Production (GRDP) and Industrial Distribution by Region

First, let us overview the geographical distribution of GDP. Figure 1 shows the relative size of GRDP (contribution of each provincial GRDP to GDP) and industrial composition in each region in 2003. Summing up for regions, Java accounts for 60 percent of GDP, followed by Sumatra at 22 percent, Kalimantan at 9 percent, Sulawesi at 4 percent and other parts of eastern Indonesia at 3 percent. The industrial composition

¹ As the data was still preliminary at the time this report was prepared, there is a possibility that analysis using future finalized tables may differ slightly from our results.

also differs among provinces. The manufacturing industry is being concentrated in Java, Sumatra mainly conducts agriculture centered on plantation crops such as oil palms, Kalimantan primarily performs mining and mining-related industry, Sulawesi conducts agriculture, and other parts of eastern Indonesia have a substantial share in agriculture and mining.

Figure 1 Production and Industrial Distribution by Indonesian Province, 2003



(Source) Michida[2008]

Why does the industrial distribution differ in each region? In large and medium industry statistics², approximately one third of all large- and medium-sized companies in Indonesia are categorized in the food processing, apparel and furniture material processing industries, which are resource-based industries.

These resource-based industries are located across various regions, especially outside Java. This could be because many natural resources are endowed outside Java, and industries inputting heavy or bulky resources operate near the resources to reduce material transportation costs. Meanwhile, there are a relatively small number of companies related to machinery and transportation equipment, and they are

² Large and medium industry statistics includes statistics on all companies employing 20 or more persons.

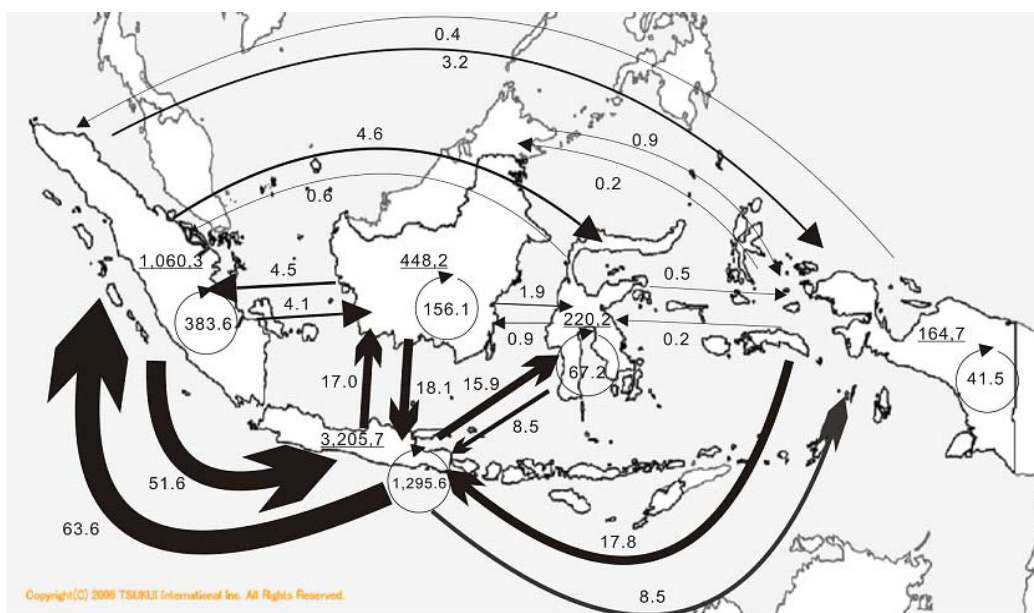
concentrated in Java and partially in Riau Province. The reasons for the concentration of the machinery industry include the availability of transportation infrastructure such as ports, airports and roads connecting inside and outside the country, and the proximity of supporting industries such as the parts industry, making it easy for companies to trade and exchange information with parties making orders, recipients of sales and customers.

The differences in the location and scale of industry suggest that there is a different growth mechanism in each region.

2.2 Structure of Goods and Services Transfer between Regions

Growth mechanisms are not completed within a region. Growth in a certain region creates demand in other regions for the goods required for production, and also has an impact on growth in other regions.

Figure 2 Production and Transfers of Each Region, 2005 (Units: trillion rupiah)



(Note) The arrows denote transfers between the five regions of Java, Sumatra, Kalimantan, Sulawesi, and other parts of eastern Indonesia. The underlined figures within each island denote gross production, and the figures inside circles with arrows denote intermediate input within the island.

(Source) Michida[2008]

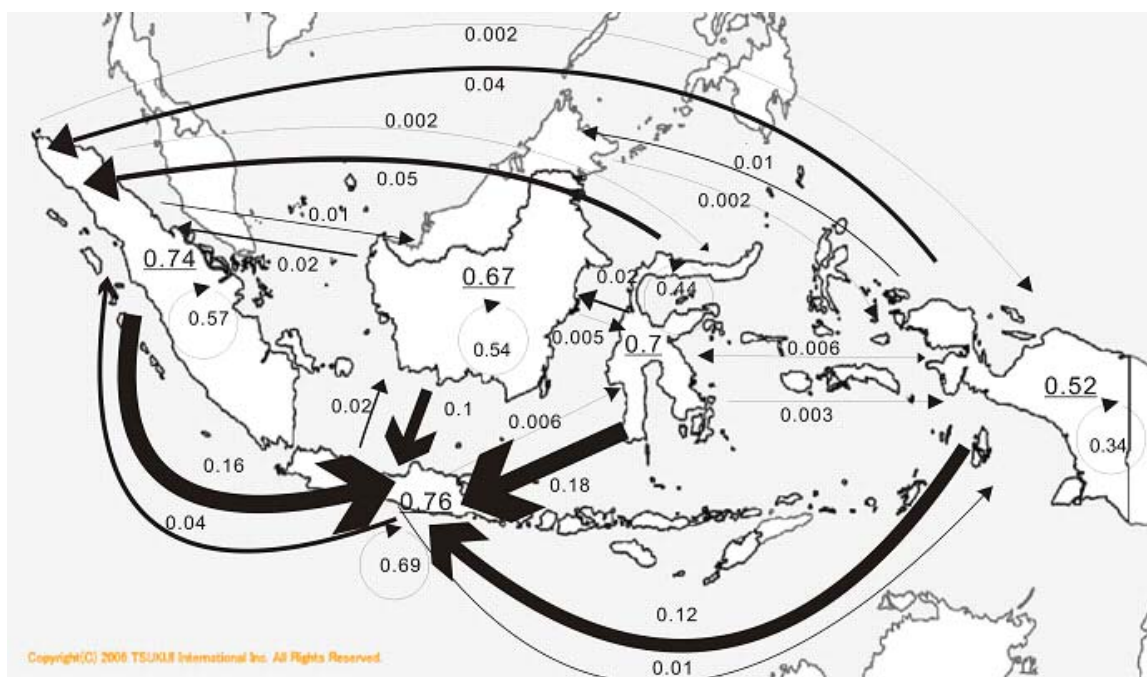
Figure 2 separates Indonesia into Java & Bali (referred to Java below), Sumatra, Kalimantan, Sulawesi and other parts of eastern Indonesia, and displays production by region, as well as transfers to and from regions based on the inter-provincial input-output table(at producers' prices) in 2005. The relative size of transfers is denoted by the size of the arrows. As can be seen in the figure, the transfers in highly productive

Java and Sumatra greatly outweigh transfers in other regions, and they form a major economic bloc. By contrast, Sulawesi and other parts of eastern Indonesia have relatively small transfer amounts, showing that they are less affected by other regions.

2.3 Spillover Effects of Growth

Industrial distribution and links between production activities differ between islands and regions, which suggests that there are different spillover effects of growth depending on the region and industrial sector. Spillover effects refer to the effect of enhancing production when final demand for a good or service from a certain region or industry occurs, such as the creation of demand for intermediate input for meeting final demand and the increase in production in other regions and industries that supply the intermediate input.

Figure 3 Spillover Effect of Growth, 2005



(Source) Michida[2008]

Figure 3 shows the economic spillover effect when the final demand is increased by one unit in Sumatra, Java, Kalimantan, Sulawesi and other parts of eastern Indonesia³. The figure shows the total spillover effect⁴ (underlined figures), the

³ The Leontief inverse matrix was calculated using Inter-Regional Input-Output Table. Specifically, if A is the input coefficient matrix, this is $(I-A)^{-1}$. See Michida[2008] for details on the analysis and results.

⁴ Here, the spillover effect refers to the figure excluding the unit of final demand that initially occurred.

spillover effect within the region (circled figures) and the spillover effect outside the region (figures and arrows pointing toward the destinations). For example, if final demand in Sumatra increases by one unit, there is a spillover effect of 0.57 within Sumatra. In addition, 0.16 units of demand to industries located in Java (arrow from Sumatra to Java, same applies below), 0.01 units of demand to Kalimantan, 0.002 units of demand to other parts of eastern Indonesia and 0.002 units of demand to Sulawesi are generated.

Looking at the increase in the spillover effect for the entire country when final demand increases by one unit in each region, Java has the greatest spillover effect; the spillover effect is 0.76 units for the entire country, comprising 0.69 units within the island and 0.07 units outside the island. The nationwide spillover effect is highest in Java (0.76), followed by Sumatra (0.74), Sulawesi (0.70), Kalimantan (0.67) and finally other parts of eastern Indonesia (0.52)⁵. As Java and Sumatra have relatively advanced production structures, it is believed that input is required from a variety of industries, which has the effect of inducing more production when final demand occurs.

Looking at the structure of the spillover effect, 90 percent of the spillover effect originating on Java is limited to within Java. On Sumatra, 77 percent remains within Sumatra and 21 percent spreads to Java. On Kalimantan, 80 percent remains on the island and 15 percent extends to Java; on Sulawesi, 63 percent remains within the island and 26 percent extends to Java; and in other parts of eastern Indonesia, 65 percent remains within the region, while 23 percent extends to Java. Regardless of where final demand is increased in Indonesia, it is clear that there is a strong spillover effect extending to Java (In the figure, this is represented by the large arrows directed toward Java from various regions)⁶. This is presumably because the resources used in the resource processing industry are located in outer islands, but the other materials input are produced in Java, such that production activities outside Java are highly dependent on Java's industry. When final demand increases by one unit in other regions, the combined spillover effect on Java is 0.56, which is the highest figure. The next highest is Sumatra (0.17). Conversely, Sulawesi (0.02) and other parts of eastern Indonesia (0.02) are the regions least benefited from spillover effects⁷. Kalimantan (0.06) is midway between these.

⁵It is also possible to specify this spillover effect by province. The province with the largest spillover effect was West Java (1.05), followed by Banten (0.96), Central Sulawesi (0.95), Bali (0.93) and West Kalimantan (0.90).

⁶ When final demand increases by one unit in each region, the province most affected by the spillover effect is Banten (2.2), followed by Central Java (2.1), West Java (2.0), Jakarta (0.9) and East Java (0.8), which are all located on Java.

⁷ When looking at the figures for provinces least susceptible to spillover effects by combining the spillover effects when final demand increases by one unit in other provinces, the least affected province is Gorontalo (0.0005), followed by Maluku (0.004), North Sulawesi (0.007), Bangka-Belitung (0.01) and South East Sulawesi (0.01).

Meanwhile, when final demand increases on Java, this mainly induces greater production within Java, whereas the spillover effect to other regions is small. As shown in Figure 1, because around 60 percent of Indonesian production takes place on Java, the input materials may be procured from industry within Java. In addition, Java is also the location of many industries such as the machinery industry that do not rely on resources. The fact that 13 percent of the intermediate input is dependent on imports from foreign countries could be seen as a reason for the limited spillover effect on eastern Indonesia which possesses many resources.

2.4 Spillover Effects by Region and by Industry

Taking a closer look at the above spillover effect inside and between regions reveals differing effects for each region and industry. Next, we examine the spillover effect for all industries in each region when final demand increases in a certain industry within a certain region. The key industries that have a high spillover effect for all of Indonesia (total of 1.0 or more) and the regions subject to spillover effects are shown in Table 1.

Table 1 Ranking of Spillover Effect by Region and by Industry

Relative rank within region	Industry	Spillover effect	Main recipients of spillover effect
Java			
1	Electrical machinery and electronic products	1.42	Island 1.4
2	Air transport	1.33	Island 1.2
3	Textiles and textile products	1.27	Island 1.2
4	Metal products	1.24	Island 1.2
5	Oil palm	1.16	Island 0.5, Sumatra 0.5
6	Shoes	1.11	Island 1.0
7	Wood, wicker and bamboo products	1.11	Island 0.9, Kalimantan 0.1
8	Pulp and paper products	1.00	Island 0.9
Sumatra			
1	Air transport	1.38	Island 0.9, Java 0.4
2	Electrical machinery and electronic products	1.26	Island 0.8, Java 0.5
3	Textiles and textile products	1.17	Island 0.7, Java 0.4
4	Oil palm	1.15	Island 1.0
5	Rubber and rubber products	1.13	Island 0.9, Java 0.2
6	Marine transport	1.10	Island 0.7, Java 0.4
7	Food and beverages	1.08	Island 0.9, Java 0.2
8	Hotels and restaurants	1.07	Island 0.9, Java 0.1

9	Electricity, gas, water	1.07	Island 0.8, Java 0.2
10	Construction	1.06	Island 0.7, Java 0.3
11	Pulp and paper products	1.06	Island 0.9, Java 0.2
12	Wood, wicker and bamboo products	1.05	Island 0.9, Java 0.2
13	Metal products	1.05	Island 0.6, Java 0.5
Kalimantan			
1	Rubber and rubber products	1.39	Island 1.2, Java 0.1
2	Food and beverages	1.31	Island 1.1, Java 0.2
3	Air transport	1.16	Island 0.7, Java 0.4
4	Marine transport	1.16	Island 0.6, Java 0.4
5	Wood, wicker and bamboo products	1.14	Island 1.0, Java 0.1
6	Electricity, gas, water	1.06	Island 0.8, Java 0.2
7	Hotels and restaurants	1.05	Island 0.8, Java 0.1
Sulawesi			
1	Food and beverages	1.21	Island 1.0, Java 0.1
2	Construction	1.20	Island 0.7, Java 0.4
3	Steel and basic nonferrous metals	1.13	Island 0.7, Java 0.2
4	Wood, wicker and bamboo products	1.10	Island 0.8, Java 0.2
5	Cement	1.08	Island 0.8, Java 0.3
6	Air transport	1.07	Island 0.5, Java 0.4, Sumatra 0.1
7	Textiles and textile products	1.04	Island 0.4, Java 0.5
8	Pulp and paper products	1.02	Island 0.4, Java 0.3, Sumatra 0.3
Other parts of eastern Indonesia			
1	Steel and basic nonferrous metals	1.27	Region 1.1, Java 0.1
2	Air transport	1.21	Region 0.5, Java 0.5, Sumatra 0.1
3	Oil palm	1.08	Sumatra 0.5, Region 0.3, Java 0.1
4	Marine product processing	1.06	Region 0.9, Java 0.1
5	Marine transport	1.05	Region 0.9, Java 0.5, Sumatra 0.1
6	Hotels and restaurants	1.04	Region 0.8, Java 0.1, Sumatra 0.1

(Source) Michida[2008]

The industries that have a high spillover effect for all of Indonesia are mainly resource and manufacturing industries, such as electrical/electronic equipment, textiles/textile products, oil palm & rubber products, food & beverages, wood/wicker/bamboo products, pulp/paper products, steel/nonferrous metals, and

construction. It can also be seen that the spillover effects of transportation services such as airlines and surface transport, together with service industries such as hotels and restaurants are high throughout all regions. Meanwhile, industries with low spillover effects include agriculture, oil and gas.

Examination by region gives insight into distinct characteristics in industries with a high spillover effect in each region. In Java, these are the electrical/electronic products industry and the textiles industry, while in Sumatra they include the oil palm and rubber industries in addition to electrical/electronic equipment and textiles. The electrical/electronic products industry is not located outside these two regions and has an extremely small spillover effect if present. In Kalimantan, Sulawesi and Sumatra, resource processing industries such as food & beverage processing, and wood/wicker/bamboo products have a high spillover effect. While the food & beverage processing, and wood/wicker/bamboo products industries operate in other parts of eastern Indonesia, the spillover effect is small. Industries that have the high spillover effect in this region are those handling resources such as the steel/nonferrous metals and marine product processing.

One thing that can be seen here is that the same industries have the different spillover effects depending on whether they are located in advanced regions including Java and Sumatra or not. In particular, compared to the high spillover effect of the electrical/electronic products and textiles industry in Java and Sumatra, resource and resource processing industries have a higher effect of inducing production in eastern Indonesia. This signifies that even if a policy is adopted to transfer the machinery industry that has a high spillover effect in Java to eastern Indonesia, such intervention cannot be expected to effectively induce production unless industry grows and takes root in the location to which it is transferred.

2.5 The Impact of External Demand and Domestic Demand

Increasing final demand is an effective way of promoting growth, but what kind of demand promotion policies should be adopted? The effect created differs for each region and industry depending on whether domestic demand is increased or external demand is increased.

Because of this, we have examined the regions and industries contributed to by external demand and domestic demand by assuming the two extreme cases of all of Indonesia's final demand being external demand and all of it being domestic demand⁸. Although not presented in this paper⁹, listing regions in the order of the number

⁸ Specifically, for external demand, total final demand was divided by total external demand, and the external demand vector was multiplied by this scalar coefficient. This makes it possible to calculate a scenario in which external demand is the same as total final demand.

⁹ See Michida[2008] for detail.

industries influenced by external demand, Sumatra (18 industries) is first, followed by Java (14 industries), Kalimantan (10 industries), Sulawesi (7 industries) and other parts of eastern Indonesia (5 industries). This implies that increased external demand plays a significant role in many industries in Sumatra and Java. We have already illustrated that there is a need to increase final demand to promote growth in eastern Indonesia because of the small spillover effect occurring through the structure of intermediate input in production. It can be said that an increase in domestic demand is particularly important for many industries in such a scenario.

Examination by region and by industry revealed that external demand makes a major contribution to a variety of industries in Sumatra through increased production. These industries span from agroforestry including oil palms to manufacturing such as mineral resources including oil, wood products, metals, chemicals, electrical machinery and electronic devices. In Java, increased production for external demand has a significant effect on light industrial products such as textiles and wood products, but domestic demand has a greater effect on electrical machinery, electronic devices, and transportation equipment such as automobiles and motorcycles. In Kalimantan, the impact of external demand was most pronounced for mineral resources such as coal, wood products and agricultural products, while in Sulawesi, the impact was greatest for agricultural products, mineral resources, food and beverages, nonferrous metal resources, resource processing and chemicals. In other parts of Indonesia, most industries have increased production mainly when domestic demand increases, but increased exports have a significant impact on wood products, processed marine products and mineral resources.

Overall, policies for forming a domestic market and for encouraging trade across regions should be effective in regions and industries where domestic demand has an impact. On the other hand, measures such as the establishment of systems and infrastructure for encouraging trade with foreign companies are believed to be necessary in regions and industries where external demand has an impact.

2.6 Summary

Based on the analyses to this point, policies for generating final demand have the greatest nation-wide spillover effect when implemented in Java and Sumatra, which will be justified on efficiency ground. However, it is also important to stress that there is little spillover effect on other regions when final demand is increased in Java and Sumatra because production inducement effect is circulated mainly within the regions. Because of this, aid to Java and Sumatra is preferable when considering efficiency, but such policies could expand regional disparity. In order to promote growth in regions outside Java, it is better if the final demand is increased in each respective island/region.

If emphasis is given to reducing regional disparity, it is preferable to assist each region even if short-term efficiency is somewhat sacrificed. Realistically, it should be possible to revitalize Indonesia's growth mechanism by adopting a two-pronged policy of enhancing the industrial sector in Java and Sumatra where high growth can be expected, while also promoting growth in Kalimantan, Sulawesi and other parts of eastern Indonesia, with this growth also spreading to Java and Sumatra. In other words, "a two-faceted growth strategy by region" i.e., a differential but simultaneous growth strategy for the west (Java and Sumatra) and east (Kalimantan, Sulawesi, and other regions of eastern Indonesia), is required.

3 Mechanism of Employment Creation

The previous section examined inter-regional/provincial and inter-industrial transactions and spillover effects by region and by industry, and has found that industries that have a high spillover effect significantly differ by region. Specifically, we found that manufacturing industry, such as the textiles industry and the electrical machinery and electronic device industry in Java and Sumatra, and resource processing industries in Kalimantan and other regions of eastern Indonesia have high potential to promote growth. A next question we would like to address is whether such growth strategies efficiently create employment. If this is not the case, undue emphasis on promotion of those industries would not be warranted. Thus, in this section, we analyze which industry's economic growth has the largest potential for creating employment by region. The data used in this section mainly come from population census and labor force survey in 1985 and 2005.

3.1 Impacts of Growth by Industry on Employment: National Level

First, let us examine the employment impacts by industry in the period between 1985 and 2005. The first column of Table 2 shows the average employment growth rate of each industry (per annum), and the second column the average GDP growth rate of each industry. The third column is the employment elasticity, which indicates how much percent the employment in each industry was expected to grow when the industry's GDP increased by one percent. This figure can be calculated by the employment growth rate divided by the GDP growth rate. Even though the employment elasticity is large enough, its impact on the whole domestic employment could be small if its employment share is small. If we take the sector of Mining and quarrying as an example, its elasticity is the largest among industries but this sector only hired 0.7% of total employment in 1985. So this sector's GDP growth could not lead to substantial employment growth. To compare the impact on total employment, we use the share of employment of the starting point, that is the year 1985, as a weight (shown in column 4). The fifth column

shows how much percent of the whole domestic employment is created corresponding to a one percent increase in industrial growth, which can be written as

$$\frac{\Delta L_i / \Delta Y_i}{L / Y_i} = \left(\frac{\Delta L_i / \Delta Y_i}{L_i / Y_i} \right) \cdot \frac{L_i}{L},$$

where subscript *i* denotes the industrial sector; Y is the value of output; L is the number of labor force; and Δ is the change between 1985 and 2005.

Table 2. Impacts on Total Employment, 1985-2005

Industry	Growth rate of employment (1)	GDP growth rate (2)	Elasticity (3) = (1) / (2)	Employment share (1985) (4)	Impact on total employment (5) = (3) x (4)
Agriculture, forestry, hunting, fishery	0.95%	2.47%	0.38	54.7%	0.21
Mining and quarrying	3.89%	2.01%	1.94	0.7%	0.01
Manufacturing	3.62%	6.96%	0.52	9.3%	0.05
Electricity, gas and water	5.13%	10.27%	0.50	0.1%	0.00
Construction	3.89%	5.23%	0.74	3.4%	0.03
Wholesale trade, retail trade, restaurants and hotels	3.25%	5.17%	0.63	15.0%	0.09
Transportation, storage, communication	5.30%	6.76%	0.78	3.1%	0.02
Financing, insurance, real estate and business services	7.59%	4.67%	1.63	0.4%	0.01
Community, social and personal services	1.08%	3.66%	0.30	13.3%	0.04

(Source) Authors' calculation

A glance at Table 2 establishes that the agricultural sector has the largest impact on employment. If the GDP of the agricultural sector increases by one percent, total employment rises by 0.21 percent. The next largest impact is the wholesale and retail

sector, with one percent of GDP growth raising total employment by 0.09 percent, followed by manufacturing sector, whose one percent GDP growth leads to a 0.05 percent increase in employment¹⁰.

3.2 Impact on Employment by Region and Industry

Next, we would like to examine the effect on Indonesian employment when proceeding with a region-based growth strategy as discussed in the previous section. We especially focus on the potential to absorb employment by manufacturing industry, such as the textiles industry and the electrical machinery and electronic device industry in Java and Sumatra, and resource processing industries in Kalimantan and other parts of eastern Indonesia.

Table 3 Impact on Domestic Employment by Region and Industry

Relative rank within region	Java		Sumatra	
	1	Wholesale and retail	0.061	Wholesale and retail
2	Manufacturing	0.039	Agriculture, forestry and fisheries	0.012
3	Agriculture, forestry and fisheries	0.038	Manufacturing	0.007
4	Social services	0.023	Social services	0.007
5	Construction	0.021	Construction	0.006
6	Transportation and telecommunications	0.017	Transportation and telecommunications	0.004
7	Mining and quarrying	0.006	Mining and quarrying	0.004
8	Finance and insurance	0.006	Finance and insurance	0.001
9	Electricity, gas and water	0.000	Electricity, gas and water	0.000

¹⁰ When we investigated the difference between the ten years before the crisis (1985-1995) with the ten years including the crisis (1995-2005), the industry with the highest impact on employment in the first ten year was the Community, social and personal services sector, followed by the wholesale/retail sector, the agriculture sector and the manufacturing sector. The ranking of the agricultural sector was low when compare to the entire period (20 years) investigated. Meanwhile, the figure for agriculture is extremely high in the latter 10 years, followed by the wholesale/retail sector and the construction sector. This suggests that the agricultural sector functioned as a buffer where workers went back to after the crisis.

Relative rank within region	Kalimantan		Sulawesi		Other Eastern Indonesia	
1	Agriculture, forestry and fisheries	0.014	Agriculture, forestry and fisheries	0.013	Agriculture, forestry and fisheries	0.021
2	Wholesale and retail	0.005	Wholesale and retail	0.004	Manufacturing	0.002
3	Manufacturing	0.002	Social services	0.004	Wholesale and retail	0.002
4	Social services	0.002	Manufacturing	0.001	Social services	0.002
5	Mining and quarrying	0.001	Construction	0.001	Construction	0.001
6	Construction	0.001	Transportation and telecommunications	0.001	Transportation and telecommunications	0.001
7	Transportation and telecommunications	0.001	Mining and quarrying	0.000	Mining and quarrying	0.000
8	Electricity, gas and water	0.000	Electricity, gas and water	0.000	Electricity, gas and water	0.000
9	Finance and insurance	0.000	Finance and insurance	0.000	Finance and insurance	0.000

(Source) Author's calculation based on GDP by region and industry (at 1993 prices) and number of labor (population census, labor statistics).

The impact on total employment by region and industry is shown in Table 3¹¹. In Java (including Bali), the employment impact of the wholesale and retail sector is the largest, followed by the manufacturing industry. If the GDP of the manufacturing sector in Java increases by one percent, total employment rises by 0.04 percent. The impact of Sumatra's manufacturing sector is also relatively high at 0.007 percent. These two manufacturing industries fall within the top 15 when listing all industries of all regions in the order of the employment impact. In short, the growth strategy based on promoting the manufacturing industry in Java and Sumatra could lead to effective employment creation for Indonesia as a whole.

In Kalimantan, Sulawesi and other parts of eastern Indonesia, the agricultural sector has the highest effect on employment. However, this is caused mainly by the larger employment share in the agricultural sector. In the long run, since the employment share of agriculture is expected to continue to decrease,¹² the impact of

¹¹ The estimation is based on equation by

$$\frac{\Delta L_{i,s}}{L} \bigg/ \frac{\Delta Y_{i,s}}{Y_{i,s}} = \left(\frac{\Delta L_{i,s}}{L_{i,s}} \bigg/ \frac{\Delta Y_{i,s}}{Y_{i,s}} \right) \cdot \frac{L_{i,s}}{L_s} \cdot \frac{L_s}{L}$$

(s: region, i: industry)

¹² For example, the employment share of the agricultural sector was 64.8 percent in 1985 and fell by ten percentage points to 54.5 percent in 2005. Similarly, this share fell from 62.3 percent to 56.2

agricultural sector's GDP growth on employment should diminish in the future. Moreover, it needs to be also noted that excessive employment has been pointed in the agriculture sector¹³ and employment in agricultural sector does not necessarily mean an improvement of welfare (increase in income).

When focusing on industries other than agriculture, the manufacturing sector has the third highest figure in Kalimantan. Therefore, those industries such as the rubber and rubber products industry (1st), the food and beverages industry (2nd) and the wood/wicker/bamboo products industry (5th) listed with high spillover effects shown in section 2.2 could be strong candidates for having a relatively large impact on employment within the region.

In Sulawesi, the manufacturing industry has a smaller impact on employment, while the wholesale and retail industry and the social and personal services industry have a substantial impact. This suggests that promoting the manufacturing industry (resource processing industry) in Sulawesi is not likely to directly lead to employment creation. It could be pointed out that measures for promoting tertiary industries (such as the wholesale and retail industry) are important from the perspective of providing employment.

Finally, the wholesale and retail industry, the social and personal services industry and the manufacturing industry have a relatively large impact on employment in other parts of eastern Indonesia. So the growth strategy of promoting resource processing industry would be effective in terms of employment generation as well.

3.3 Summary

Let us summarize this section. It is confirmed that agriculture played a significant role throughout Indonesia from the perspective of creating employment in the last 20 years. However, considering this sector's relatively low expected growth rate as well as excessive employment, it is doubtful that agriculture will be a key sector for generating employment. The manufacturing industry, which has a large economic spillover effect in Java and Sumatra as we found in the previous section, also has strong impacts on employment in these regions. Therefore, promoting the manufacturing industry in Java and Sumatra could be considered more effective in terms of increasing employment.

Meanwhile, in Kalimantan, Sulawesi and other regions of eastern Indonesia, the economic spillover effect of the resource processing industry is high and these sectors also have a relatively high impact on employment generation.

percent in Sulawesi, and from 71.8 percent to 65.6 percent in other parts of eastern Indonesia. However, the share has been increasing outside Kalimantan during the period from 1995 to 2005 that included the crisis.

¹³ Refer to Shintani [2004] for details on excessive employment in the agriculture sector. Meanwhile, the role of the agricultural sector as a social safety net especially after the Monetary Crisis should also be noted.

4 Overcoming Poverty and Inequality

We have so far investigated strategies that should be taken by Indonesia from the perspective of growth and employment. The importance of “two-faceted strategy by region”, i.e., differential but simultaneous growth promotion for the west and east Indonesia” has also become clear. The existing literature in recent years has discussed that economic growth is a necessary condition for the reduction of poverty¹⁴, and the above growth strategy should have a significant effect on poverty reduction as well. However, it is also true that poverty cannot be eliminated simply through growth. Because of this, it is necessary to pursue “two-faceted strategy of growth and poverty reduction”, whereby direct poverty reduction measures are implemented for groups and regions not affected by economic growth mechanisms. In this section, we quantitatively explore the regions and groups that have not sufficiently benefited from growth and investigate reasons behind this. We also consider what kind of aid would be effective for raising the standard of living in poor regions. The data in this section are derived mainly from Susenas 2005 and Podes 2006.

4.1 The Source of Poverty and Inequality

(1) Regional Disparity and Urban-Rural Disparity

In order to draw general pictures on the current poverty situation in Indonesia, we present the proportion of households in poverty by region in 2005 in Table 4¹⁵.

Table 4 Ratio of Households in Poverty by Region and Urban/Rural Areas

	Average	Urban areas	Rural areas
Sumatra	0.148	0.127	0.160
Jakarta, West Java, Bali	0.100	0.089	0.115
Central Java, East Java, Banten	0.187	0.135	0.227
East and West Nusa Tenggara	0.249	0.238	0.253
Kalimantan	0.107	0.081	0.120
Sulawesi	0.187	0.124	0.212
Maluku/Papua	0.227	0.095	0.279
Nationwide	0.156	0.117	0.186

(Source) Susenas 2005

¹⁴ Examples can be found in Kakwani and Pernia [2000], Dollar and Kraay [2002], and Timmer [2004].

¹⁵ Households with a standard of living per capita that falls below the poverty line are defined as “households in poverty.” When looking on a national level, the 2005 poverty line for cities and villages has been announced by the BPS Indonesia, but the poverty line by region has only been announced until 2004. In this analysis, we calculate the figure obtained by multiplying the regional/urban-rural poverty line by the inflation rate, and this figure was adopted as the poverty line for 2005. In order to prevent bias in analysis stemming from extreme figures, we have excluded changes of less than one percent in per capita consumption standards for the scope of the analysis (same applies below). Sample households have also been weighted according to population size.

According to this table, Central and East Java, Banten, East and West Nusa Tenggara, Sulawesi, Maluku and Papua have a relatively large number of households in poverty. Compared to Jakarta and Bali, which have the lowest ratio of households in poverty, Sulawesi has around 1.9 times as many households in poverty, while East and West Nusa Tenggara have around 2.5 times as many households in poverty. These poor regions are generally located in eastern Indonesia.

Given the gap between the west and east Indonesia, there is no doubt that efforts to eliminate disparity between east and west must be provided. At the same time, however, it is important to observe that there is a disparity between urban and rural areas within a region; on average, 12 percent of households are poor in urban areas, while 19 percent of households are poor in rural areas. Similar to the cases stated earlier, rural areas in eastern Indonesia tend to be poorer.¹⁶

The above figures show that an overall disparity is caused both across regions and between urban and rural areas within a region. A natural question is as to which one is more responsible for the overall inequality. In order to examine this, we performed a decomposition analysis of the consumption inequality¹⁷. The overall inequality is decomposed into two factors: within region and between regions. For example, if the consumption levels of each household are identical within a region, and only differ between regions, the contribution of “within region inequality” to the overall inequality is zero (the contribution of “between regions inequality” is 100). On the other hand, if there are variations in the consumption level of each household within a region and the average consumption levels in each region are equal, the contribution of “between regions inequality” to the overall inequality is zero (the “within region inequality” is 100). Here, regions are classified into (1) the seven regions as in Table 4 above, (2) provinces, and (3) urban and rural areas. Table 5 shows the decomposition result.

When classifying into seven regions, approximately 7 percent of national inequality is attributable to inequality between thus defined regions, and the remaining 93 percent is due to inequality within each region. When further breaking down regions into provinces, approximately 14 percent of national inequality is brought about by inequality between provinces. If regions are divided into urban and rural areas, 19 percent of the overall inequality is attributed to differences between regions, making it the largest of the three types of inter-regional inequality¹⁸. These findings suggest that

¹⁶ However, although not shown in the table, there are some rural areas with serious poverty in western Indonesia as well, with more than 18 percent of households in poverty, such as Riau, Lampung, West Java and Yogyakarta.

¹⁷ Gini's coefficient is the most popular index of inequality, but because Gini's coefficient is not suitable for in the decomposition analysis, the Theil index has been used.

¹⁸ This result is consistent with Akita et. al. [1999] that performed similar analysis using Susenas data until 1993.

reducing the disparity between urban and rural areas is more important than reducing disparity between provinces to promote nationwide equality.

Table 5 Theil Index Decomposition Analysis, 2005

	Contribution (%)	
	Within region	Between regions
By 7 regions	93.2	6.8
By province	85.6	14.4
By urban/rural	81.0	19.0

(Source) Same as Table 4.

(2) Growth Elasticity of Poverty in Urban and Rural Areas

So, why are rural areas poorer than urban areas? Is it because the growth rate in rural areas is lower than in urban areas, or is it because the growth is less linked to poverty reduction in rural areas? As a measurement for the latter, the existing literature has used so called the “growth elasticity of poverty.” The “growth elasticity of poverty” is the percentage reduction in poverty caused by one percent of growth, and the larger this figure (absolute) is, the more growth is linked to poverty reduction. In general, this figure is higher when more of the poor receive the benefits of growth. Of course, in order to achieve significant poverty reductions, both high growth and high growth elasticity of poverty are required. Here, we examine the elasticity of growth by region and attempt to answer the questions above.

Table 6 Per Capita Household Consumption Growth and Growth Elasticity of Poverty by Region, 2002-2005

	Annual growth rate (%)		Growth elasticity of poverty		Annual reduction of poverty (%)	
	Urban	Rural	Urban	Rural	Urban	Rural
National average	2.93	2.08	-2.71	-1.22	-7.95	-2.53

(Source) Susenas 2002, 2005

Table 6 reports that the average annual growth rate of per capita household consumption was 2.9 percent in urban areas between 2002 and 2005, while it was 2.1 percent in rural areas during the same period. Similarly, the growth elasticity of poverty in rural areas has worse performance than urban areas. In fact, whereas one percent of growth in urban areas leads to 2.7 percent reduction of poverty, it reduces poverty only by 1.2 percent in rural areas. Put together, low growth and low elasticity resulted in only

2.5 percent reduction in poverty per annum between 2002 and 2005 in rural areas, widening the gap with urban areas where the ratio of the poor households declined by 8 percent per annum.

(3) Source of Urban-Rural Disparity¹⁹

In order to investigate the source of urban-rural disparity in further detail, we turn to examine the characteristics of the households and communities in urban and rural areas using socioeconomic data (Susenas) for 2005 and potential desa (Podes) for 2006.

In Table 7, it is shown that per capita household consumption has reached 300,000 to 400,000 rupiah in urban areas in both West and East, but this is only around 200,000 rupiah in rural areas, signifying that the standard of living in urban areas is 1.8 to 2 times as high as in rural areas. The years of education of the household head in urban areas is also quite high at nine years, but is particularly low at less than six years in rural areas in both West and East regions. This means that the educational attainment of the household head in urban areas is around the level of graduation from junior high school, while that in rural areas is equivalent to graduation from elementary school. The data on characteristics of households further show that an overwhelming number of working-aged populations in rural areas have only an elementary school level of education, while there are a high proportion of workers in urban areas who have a high school level of education.

In addition, the average community characteristics are generally favorable in urban areas, with little variation between West and East, but the gap between urban and rural areas is markedly large. For example, the ratio of toilets (private or public) in communities is almost 100 percent in urban areas, but only around 50-60 percent in rural areas. Moreover, while around half of all cities have hospitals, there are almost no hospitals in rural villages. The same applies for banks and sealed roads. Such urban-rural disparity is also clear from the number of companies; there is a gap of 2-11 times between urban and rural areas in terms of the number of large companies with 100 or more employees and medium-sized companies with 20 or more employees.

¹⁹ Even though Governemnt of Indonesia usually treat Kalimantan as a part of the eastern Indonesia, this section consider Kalimantan as west because statistical examination shows that the average living standard of Kalimantan is comparable to Java and Sumatra rather than to Sulawesi and other parts of eastern Indonesia.

Table 7 Summary Statistics by region and by Urban/Rural Area

	Urban areas		Rural areas	
	West	East	West	East
Ratio of households in poverty	0.11	0.15	0.19	0.23
Per capita household consumption (000Rp)	440.1	371.85	224.73	201.4
<i>Characteristics of household head</i>				
Age	45.07	43.41	46.77	44.69
Male (=1)	0.87	0.85	0.88	0.87
Years of education	8.72	9.16	5.72	5.87
<i>Characteristics of household</i>				
Ratio of working age members	0.64	0.6	0.63	0.61
Ratio of males	0.46	0.45	0.46	0.46
Education level, ratio of elementary school	0.4	0.37	0.62	0.53
Education level, ratio of junior high school	0.19	0.17	0.16	0.17
Education level, ratio of high school	0.31	0.35	0.11	0.15
Education level, ratio of tertiary education	0.1	0.12	0.02	0.03
Drinking water, [AMDK](=1)	0.38	0.49	0.09	0.12
<i>Characteristics of community</i>				
Private and public toilets (=1)	0.95	0.92	0.63	0.53
Hospitals (=1)	0.64	0.4	0.14	0.06
PUSKESMAS (=1)	0.64	0.61	0.5	0.61
Asphalt-sealed roads (=1)	0.93	0.94	0.6	0.56
Banks (=1)	0.52	0.4	0.09	0.05
Number of large enterprises (100 or more employees)	1.67	0.07	0.16	0.03
Number of small and medium enterprises (20-99 employees)	2.93	0.28	0.26	0.08

(Source) Susenas 2005 and Podes 2006.

4.2 Measures for Reducing Poverty and Disparity

We have so far confirmed that: (1) rural areas are poorer than urban areas; (2) the growth rate of rural areas is lower than urban areas and the effect of growth on poverty reduction is also lower in rural areas; and (3) education and infrastructure in rural areas is inferior to those in urban areas. In this section, we statistically examine what kind of measures will reduce poverty in each of rural areas and urban areas in West and East regions.

For this purpose, we run regressions separately for rural and urban areas as well as West and East regions. In estimation, we employ a probit model in which the dependent variable takes the value of 1 if household is poor and 0 otherwise. The independent variables include: {**Characteristics of household head**: age, gender, years of education} {**Characteristics of household**: household size, ratio of working members²⁰, ratio of males among members that are of working age, ratio of working age members with elementary school, junior high school, high school or tertiary education experience among people, loans to household, floor-area, drinking water availability} {**Characteristics of region of residence**: toilet usage, presence of hospitals and clinics (PUSKESMAS), establishment of roads, presence of banks, number of large and medium companies}. The estimation results are shown in Table 8.. The numbers in the table show the marginal impacts evaluated at the mean value of the independent variables. The result shows important findings as follows.

First, the probability of poverty decreases with age and years of education of household head, regardless of the urban-rural classification or region.

Second, there is a lower probability of poverty in rural areas if the head of the household is male, but this does not apply in urban areas. A similar trend can be seen in the ratio of working members. In fact, in rural areas in the West, there is a lower probability of poverty if there is a higher ratio of working males. These results imply that females in rural areas face tighter constraints on the access to profitable work than those in urban counterparts.

Third, the probability of poverty increases with the household size, which is plausible, considering that poorer families tend to have more children.

Fourth, the education level of working members is closely related to poverty. In particular, if the ratio of household members with at least a high school education increases, there tends to be a significantly lower probability of falling into poverty.

Fifth, greater loans lead to a higher standard of living and increase the probability of escaping poverty.

Sixth, improvements to sanitation (represented by the presence of toilets, hospitals and PUSKESMAS) are generally effective for reducing poverty. The results also demonstrate that it is highly probable that the presence of hospitals is effective only in urban areas, while the presence of PUSKESMAS is effective only in rural areas for reducing poverty.

Seventh, the presence of sealed roads has a strong effect on the reduction of poverty in rural areas in both the East and the West, but this was only statistically significant in the West for urban areas. In the East, the probability of poverty decreases

²⁰ The number of people aged between 15 and 65 that were not enrolled in school at the time of the interview was used as the working population.

if there is a bank in the community.

Finally, the key to reducing poverty in rural areas is the development of small and medium enterprises, and not large enterprises.

Table 8 Determinants of Poverty

	Urban areas		Rural areas	
	West	East	West	East
<i>Characteristics of household head</i>				
Age	-0.001*** [6.91]	-0.001*** [6.63]	-0.001*** [7.33]	-0.002*** [8.20]
Male (=1)	-0.005 [1.58]	0.002 [0.30]	-0.023*** [4.81]	-0.031*** [3.74]
Years of education	-0.006*** [16.56]	-0.011*** [11.33]	-0.007*** [9.91]	-0.010*** [9.10]
<i>Characteristics of household</i>				
Household Size	0.028*** [42.22]	0.040*** [25.29]	0.060*** [58.71]	0.075*** [41.26]
Ratio of working age members	-0.043*** [10.26]	-0.089*** [7.38]	-0.082*** [14.00]	-0.159*** [14.62]
Ratio of males	-0.004 [0.77]	-0.008 [0.59]	-0.040*** [5.49]	0.002 [0.17]
Education level, ratio of junior high	-0.024*** [6.26]	0.004 [0.41]	-0.043*** [7.63]	-0.035*** [3.51]
Education level, ratio of high school	-0.066*** [14.66]	-0.050*** [4.92]	-0.136*** [16.08]	-0.108*** [8.51]
Education level, ratio of tertiary	-0.154*** [16.61]	-0.116*** [6.04]	-0.299*** [12.72]	-0.235*** [8.54]
Loan size (Juta)	-0.003*** [2.94]	-0.003** [2.19]	-0.005*** [3.80]	-0.007*** [3.08]
Floor space (m ²)	-0.000*** [8.06]	-0.001*** [4.86]	-0.000*** [7.12]	-0.002*** [9.38]
Drinking water, [AMDK](=1)	-0.036*** [11.18]	-0.027*** [3.40]	-0.030*** [3.97]	-0.023* [1.95]
<i>Characteristics of community</i>				
Private and public toilets (=1)	-0.011 [1.51]	-0.050** [2.05]	-0.013** [2.49]	-0.033*** [3.32]
Hospitals (=1)	-0.021*** [5.52]	-0.005 [0.49]	-0.01 [1.26]	0.023 [1.01]
PUSKESMAS (=1)	0.001 [0.20]	-0.003 [0.26]	-0.004 [0.78]	-0.016* [1.69]
Asphalt-sealed roads (=1)	-0.023*** [2.84]	-0.018 [0.80]	-0.030*** [5.55]	-0.056*** [5.73]
Banks (=1)	0.001 [0.22]	-0.026** [2.39]	-0.005 [0.57]	-0.038* [1.68]
Number of large enterprises (100 or more employees)	0.000 [0.13]	-0.022** [2.20]	-0.004 [1.28]	0.005 [0.72]
Number of small and medium enterprises (20-99 employees)	-0.001*** [3.06]	0.005 [1.44]	-0.005** [2.12]	-0.015* [1.67]
Number of Observation	77464	14713	100975	45227

(Source) Authors' estimation based on Susenas 2005 and Podes 2006. The numbers in brackets show the absolute z-statistics. *** shows a statistical significance of 1 percent, ** of 5 percent, and * of 10 percent.

5 Towards a Long-term Growth and Employment Strategy

So far, we assumed that there will be no changes to industrial structure and presented a short-term growth, employment generation, and poverty reduction strategy. In this section, we would like to discuss the economic outlook toward 2020, with due consideration of dynamic aspects of the economy. We selected 2020 as a terminal year for this analysis because in Indonesia, the government changes through presidential elections and mid-term development plans are formulated every five years. The contemporary Yudhoyono regime will end at 2009 and after 5 years duration each, subsequent two presidents will end their regimes by 2019. Thus, we believe that 2020 will be an appropriate timing to think about the long-term development strategies. Among three development issues raised above, we focus on growth and employment strategies in this section and examine the nexus between them in the dynamic context.

5.1 Indonesia's Industrial Competitiveness

To this point, we argued in Section 2.2 that it is important to increase demand for goods produced in Indonesia in order to promote growth, and we examined differences in the economic spillover effect occurring when demand is increased by one unit in Java/Sumatra and other regions. In Section 2.3, we showed that the manufacturing industry in Java and Sumatra, and the resource processing industry in other regions have a significant growth effect.

If production simply increases despite a lack of demand, it is natural that production will create an excess supply, which is not sustainable. In this section, we consider long-term development strategy until 2020 centered on external demand trends, while focusing on Indonesia's export competitiveness within the East Asian economy. Industries significantly influenced by increased external demand include electrical and electronic devices, resources, resource processing, and labor intensive industries such as textiles, but sustainability is dependent on international economic conditions and Indonesia's industrial competitiveness. What is the outlook looking toward 2020?

First, we will look at the Revealed Comparative Advantage (RCA)²¹ of major Asian countries to determine how competitive Indonesian products are in the international market in recent years. Table 9 shows a comparison of the RCA of Indonesia's key exports with the RCA of rival countries.

²¹ The export RCA of item j from country i = (value of exports of item j from country i / total export value from country i) / (value of global exports of item j / value of global exports)

Table 9 Revealed Comparative Advantage of Indonesia (Average for 2000-2003)

Export Item	RCA Index	Neighboring countries with RCA>1
Goods for which Indonesia has a comparative advantage		
Marine products	3.47	China (1.83), Philippines (1.44), Thailand (7.59), Vietnam (13.60)
Coffee, tea, spices	4.28	Vietnam (10.41)
Tobacco	1.26	
Raw rubber	10.92	Malaysia (4.41), Thailand (15.08), Vietnam (7.12)
Cork and wood	1.25	Malaysia (2.58)
Pulp and waste paper	3.47	
Metal ore and scrap metal	4.25	
Coal, cokes and briquettes	7.26	China (2.84) Vietnam (1.93)
Oil and oil products	1.98	Vietnam (3.42)
Gas (natural and manufactured)	8.68	Malaysia (3.14)
Vegetable oil	13.02	Malaysia (13.44), Philippines (4.51), Vietnam (1.28)
Animal oil	3.38	Malaysia (15.22)
Cork and wood products other than furniture	8.83	China (1.22), Malaysia (3.11), Thailand (1.08), Vietnam (1.21)
Paper and cardboard	2.1	
Textiles and textile products	2.11	China (2.51), Thailand (1.12)
Communications equipment	1.19	China (1.98), Malaysia (2.57), Thailand (1.23)
Furniture	2.44	China (1.88), Malaysia (1.51), Thailand (1.28), Vietnam (1.69)
Apparel and clothing	2.28	China (4.12), Philippines (2.15), Thailand (1.61), Vietnam (3.88)
Shoes	3.02	China (4.59), Thailand (1.51), Vietnam (13.42)
Gold (non-currency)	1.67	
Goods for which Indonesia does not have a comparative advantage		
Computers	0.72	China (2.0), Malaysia (3.52), Philippines (3.72), Thailand (2.19)
Electronic devices	0.46	China (1.05), Malaysia (2.76), Philippines (5.12), Thailand (1.6)
Land transportation equipment	0.1	Thailand (0.45), China (0.26), Philippines (0.22)

(Source) Coxhead [2005] p80-81, Table 5.3

(Note) Land transportation equipment only has figures less than 1

It can be seen that Indonesia has a comparative advantage in the fisheries, oils, mining, paper and wood product industries that are resource and resource processing

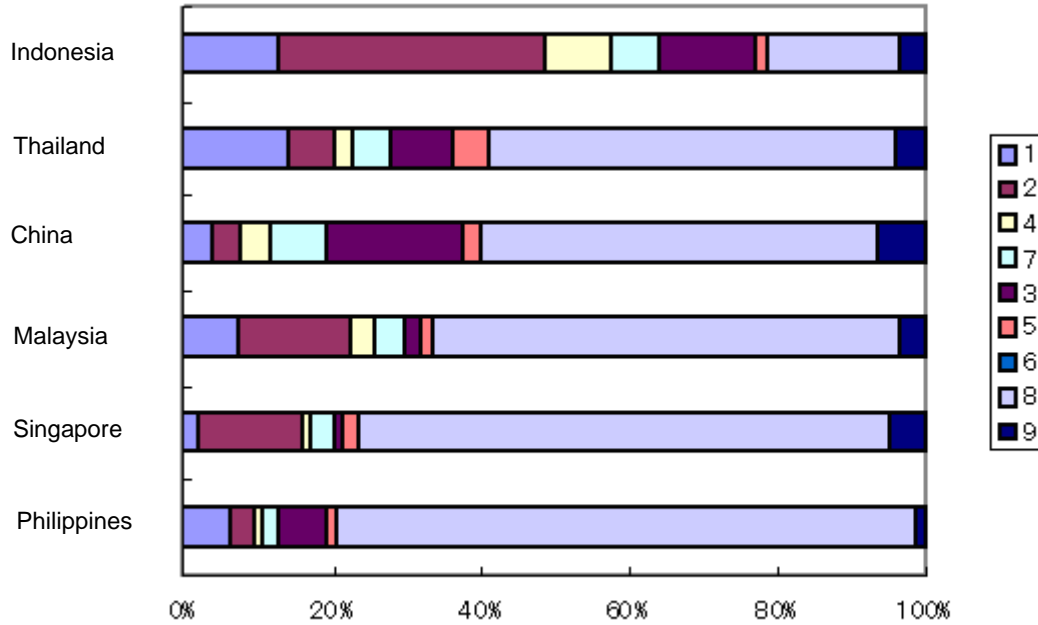
industries, and in the labor-intensive textiles and clothing industries. Of these, it has a particular advantage in resource-related industries such as rubber, vegetable oils, wood products and gas. Needless to say, the wealth of oil, gas, mining, forestry and marine resources has played an important role in the economic development of Indonesia. Although the proportion of oil and gas in Indonesian exports has fallen in recent years, the share of exports made up by all mineral resources including copper and gold is far more than in surrounding countries, and the country plays an important role in the region as a supplier of mineral resources (World Bank[2003]).

Figure 4 compares the export structure of Indonesia with neighboring countries in 2005. The export share of mineral resources has risen by 30 percent in recent years partly because of the rise in resource prices. When combining the resource processing industries for agriculture and livestock (Sector 1), minerals and processed minerals (Sectors 2 and 7), and processed wood (Sector 4), resources-related industries actually account for 60 percent of exports.

The other industry in which Indonesia has a comparative advantage is the textiles and clothing industry. However, neighboring countries such as China also have a comparative advantage, and competition in the international market is becoming keen. In relation to this situation, there are some concerns that the expansion of the Chinese economy and its participation in the global and regional markets will lead to resource-rich Southeast Asian countries becoming more specialized in resource-intensive exports and losing their advantage in labor-intensive industries such as clothing that are in competition with China (Coxland [2005]).

In Section 2.2, we confirmed that domestic demand played a significant role in the electrical machinery, electronic device, automobile and motorbike industries. Looking at the Revealed Comparative Advantage figures, it can be seen that Indonesia does not have a comparative advantage in the international markets for these industries. Meanwhile, looking at East Asia, regional economic integration is being driven by an increase in exports of electrical machinery and electronic devices, creating greater dynamism in economic growth. The share of this industry is high when looking at the trade structure of neighboring countries, but it is extremely low in Indonesia (Figure 4).

Figure 4 Export Structure of Indonesia and Neighboring Countries, 2005



(Notes)

1. The definitions of sectors are as follows

1: Sector 1: HS Code 1-24 (Meat, fish, vegetables, grain, coffee, other foods, and tobacco)

2: HS25-28 (Salt, ash, cement, mineral ore, mineral fuels and other mineral products)

4: HS41-49 (Leather, wood, paper, pulp, etc.)

7: HS72-83 (Steel, copper, aluminum and other metals)

3: HS29-40 (Chemical products, plastics, rubber, etc.)

5: HS50-65 (Textiles, fabrics, clothing, hats, etc.)

6: HS66-71 (Umbrellas, cement, ceramics, glass, precious items, etc.)

8: HS84-91 (Machinery, transportation equipment, optical equipment, clocks, etc.)

9: HS92-0 (Musical instruments, furniture, toys, miscellaneous items, art, special items, etc.)

2. All data units are denominated in local currencies

(Source) World Trade Atlas

5.2 Four Economic Growth Scenarios

In this section, we qualitatively discuss predictions of how Indonesia will change within the East Asian economy moving toward 2020 along with scenarios. Let us

consider the dynamics of the Indonesian economy based on the Indonesian export trends and the future economic environment surrounding Indonesia.

First, regional economic integration is expected to advance within East Asia, and the cost of transportation of materials across national borders is expected to fall further. The division of labor across borders among processes within an industry will also advance (Urata [2006]). China is rapidly expanding in East Asia, and the value of its trade is predicted to be the largest in the world in around 2020 (EIU[2007]). China's rich labor supply will continue to attract direct investment by multinationals, and the structure of industry will change significantly. In particular, China's growth is currently driven by coastal areas, and rising land prices and wages are becoming more and more conspicuous. This is expected to lower the competitiveness of China's labor-intensive industries²², forcing them to move from the Chinese coast. Meanwhile, China is proceeding with a strategy of attracting high-tech industries, and the production facilities of these industries will expand. If the Chinese currency appreciates in value in the future, there is a possibility that the relocation of industry will accelerate.

Since 1990, direct foreign investment has been concentrated on China, while economic growth has been relatively sluggish in ASEAN. However, the overheating of the Chinese economy is becoming a factor in rising production costs in China, and backed by lower transportation costs, there have been movements of a return of foreign direct investment to ASEAN. The decentralization of production facilities is also essential for companies to avoid the risk of concentrating production activities in China. If the ASEAN economy is able to provide companies with a stable macro economy and an environment in which efficient production activities can be carried out, there is a possibility that companies will further proceed with the division of labor in this region according to the comparative advantage of each ASEAN country. There is a high probability that labor-intensive industries that may move from coastal China will choose locations in ASEAN in the future, and it is believed that this will have an influence on trends in the ASEAN economy. In addition, Asian incomes centered on India and China will continue to rise conspicuously moving toward 2020. It is believed that there is much leeway for an increase in the production activities of ASEAN in order to meet increased demand for resources, consumer goods and investment commodities.

Over the next ten years, economic integration is expected to progress in East Asia, resulting in further advances in the division of labor within the region. In this situation, what kind of locations companies select? When a company is selecting a location from

²² The textiles industry is a typical example of a labor-intensive industry, but this includes a variety of items from low-end products for which labor is the most important factor to artificial textiles requiring a high level of technology. In cases where the price of production elements such as wages rise, it is believed that production will shift within the same industry to products with more added value.

multiple countries, soft aspects of the investment climate such as whether the country being invested in has more macroeconomic stability than other countries, whether the procedures related to business can be carried out efficiently and whether there is little uncertainty about policy are important factors in decision-making. It is also possible to lower transportation time and costs if there are roads, ports, marine transport, airports, air transport and a logistics network for linking these. Because of this, countries that have a favorable business environment with relatively good soft and hard infrastructure will be more appealing to investors. It is believed that these soft and hard aspects of the business environment can be provided through policy. In fact, not only Indonesia, but also neighboring countries such as Thailand, Malaysia and Vietnam are working to attract foreign investment to establish infrastructure aimed at improving the investment climate (Fukagawa [2006]).

Meanwhile, simply creating such an investment climate does not necessarily lead to success in attracting companies. In particular, the machinery industry including the electrical, electronic and automobile industries has a strong tendency to be located in regions where supporting industries exist nearby. For example, when ordering from a parts supplier, it is essential to be located nearby in order to make products while making adjustments with suppliers to details specifications, etc. It is also possible to lower and reduced transportation costs, time and risk when supporting industries are located closely. In this way, the agglomeration of industry is formed as a result of a variety of factors other than policy, such as location selection and economic activities of private enterprises. In addition, agglomeration of industry can enjoy the economies of scale, characterized by self-propagation in which greater concentration makes a location a more appealing location for investment.

When considering these factors, the East Asian economy will overcome concentration on China, and the location of production activities will tend to spread to other parts of Asia including ASEAN. However, for industries where supporting industries are particularly important, there will probably be a tendency to become concentrated on particular countries and locations where attractive industrial clusters have been already formed. At present, such industrial clusters are gradually formed in Bangkok in Thailand and Kuala Lumpur in Malaysia. Hanoi in Vietnam is also catching up at a rapid pace. In contrast, although there is a concentration of industry surrounding Jakarta in Indonesia, its presence is not substantial. As Indonesia casts off its “Seven Lost Years” after the Monetary Crisis in 1997 during which economic growth had been sluggish, its future position within the region will depend on performance from 2007 onwards.

In addition, income in East Asia is expected to undergo high growth until 2020. It is expected that production activities will expand to meet the rapidly increasing demand,

and demand for resources will increase further. As seen earlier, Indonesia plays a significant role as a supplier of resources centered on mineral resources within the East Asia region, and resource-related industries will continue to be important for the Indonesian economy. However, it cannot be said that sustainable resource management has been implemented until now. Thus, one of the most important keys to the future of Indonesia should be whether resources can be utilized with appropriate management to ensure sustainable economic growth.

Having discussed these, we will perform simulations of four scenarios of change in the structure of industry until 2020. For simplification, the manufacturing industry will be divided into capital-intensive, labor-intensive and resource-processing types, and we will consider hypothetical scenarios up to 2020 by focusing on the growth of capital-intensive industries such as the machinery industry in Java and Sumatra, and growth of the resource-processing industry in eastern Indonesia²³. Through this experiment, we would like consider what kind of cases would bring about the high growth rate and high employment absorption simultaneously.

The cases assumed here are high growth of capital-intensive manufacturing industries centered on machinery in Java and Sumatra (West High), low growth in the same industries (West Low), high growth in the resource and resource-processing industries in Kalimantan, Sulawesi and other parts of eastern Indonesia (East High) and low growth in the same regions (East Low). First, we describe the economic environment assumed to create each of the cases. We next combine the above four cases of the East and West to consider the impact of each case on the entire Indonesian economy, especially in terms of growth and employment. The combination of four cases yields the following four scenarios: A. West High + East High; B. West Low + East High; C. West High + East Low; and D. West Low + East Low.

The assumed international economic environment and economic cases for East and West Indonesia are shown below.

(1) High growth in the capital-intensive industries of Java and Sumatra
(West High)

Intra-industry division of labor across borders advances further and the business environment is successfully established in Indonesia. This increases the productivity of companies located in Indonesia. Economies of scale function, resulting in the increased entry of electrical machinery, electronic device and automobile industries into Indonesia. This trend promotes the formation of a concentration of industry in Java and Sumatra.

²³ Assuming that Indonesia will become a more developed country, it is believed that it will be difficult to be internationally competitive in labor-intensive industries such as the textiles industry. Because of this, they have been excluded from consideration and the same rate of growth as 2006 is assumed to continue until 2020 in the scenarios.

Increased entry by multinationals and investment by local industry lead to improvements in production technology. Capital-intensive industries drive economic growth due to increased domestic demand and exports.

(2) Low growth in the capital-intensive industries of Java and Sumatra
(West Low)

At present, Indonesia does not have a comparative advantage in the electrical machinery and electronic device industries. The government has been endeavoring to improve the investment climate, but the progress of its improvement is relatively slow compared to neighboring countries. As a result, Indonesia is less appealing as a location for companies than neighboring countries. Also, Indonesia's industry is left out of the regional production network, or companies leave due to the formation of large-scale concentrations of industry in neighboring countries, leading to a decline in capital-intensive industries.

(3) High growth of resource and resource processing industries in eastern Indonesia
(East High)

Economic development of Asian countries such as China and India accelerates further, and so do the demand for resources required for the production activities of these countries. This leads to resource prices staying high. Demand for Indonesia's resource processing industries rises, and production of processed resources increases.

(4) Low growth of resource and resource processing industries in eastern Indonesia
(East Low)

With increased demand for resources, the Indonesian economy's reliance on primary commodities increases. In face of a sharp decline in international prices of these commodities or other market risks, production decreases significantly. Furthermore, the increase in the share of resource-processing industries in total output makes the depletion of resources more severe, lowering resource exports and raw material supply to resource-processing industries, causing prices to rise and production to decline.

Based on these scenarios, we performed a simple simulation to project the Indonesian economy in 2020. Table 10 shows examples of the results of the economic growth rate and economic structure obtained through the simulation. The base line in Table 10 shows the economic structure and growth rates of each industry (actual figures), and the economic structure if this growth rate continues until 2020. In cases A to D, figures assumed for each scenario are used as the growth rates of resource-processing industries and capital-intensive industries in the manufacturing sector, and the actual figures for 2006 are used for the growth rates of other industries to

illustrate the economic structure of 2020.

Table 10 Economic Growth Scenarios for Indonesia in 2020

	<i>Base Line</i>			<i>A. W High + E High</i>		<i>B. W High + E Low</i>		<i>C. W Low + E High</i>		<i>D. W Low + E Low</i>	
	Actual Values		Forecast	Assumed	Forecast	Assumed	Forecast	Assumed	Forecast	Assumed	Forecast
	2006 Growth	2006 Share	2020 Share	Average Growth	2020 Share	Average Growth	2020 Share	Average Growth	2020 Share	Average Growth	2020 Share
Agriculture	3	14.2	9.7	3	9	3	9	3	10	3	11
Oil, gas, mining	2.2	9.1	5.6	2	5	2	5	2	6	2	7
Manufacturing	4.6	27.8	24.5	6~9	30	6~7	28	4~5	24	1~3	18
Resources	3.8	12.9	9.8	6~7	11	1~2	7	6~7	14	1~2	8
Labor Intensive	1.4	3.1	1.8	1	2	1	2	1	2	1	2
Capital Intensive	6.5	11.8	13	8~12	17	8~12	19	1~4	7	1~4	8
Service, etc	7.4	48.9	60.1	7	55	7	58	6~7	61	6~7	64
Growth Rate	5.5	100	6.1	6.7→6.2		6.5~6.0		5.3~4.8		5.0→4.5	

(Note) Resource processing industries includes, oil and gas production, food/beverages/tobacco, wood/wood products, paper/printing, cement/nonferrous minerals. Labor intensive industries include textiles/leather/shoes, and other manufacturing. Capital intensive industries include fertilizer/chemicals/rubber products, iron/steel, and machinery/transportation equipment. (Source) Actual values for 2006 are GDP statistics using the BPS website (July 1, 2007).

A. West High + East High

While the manufacturing industry in Java and Sumatra drives economic growth in Indonesia, eastern Indonesia centering on the resource and resource-processing industries also benefit from the economic growth. The macroeconomic growth rate is expected to be 6.7 percent (until 2012) and 6.2 percent (2013-2020). In this case, the share of the manufacturing industry in the GDP increases by around 30 percent. By revitalizing the manufacturing industry in Java and Sumatra, domestic demand for goods produced in eastern Indonesia increases and a high economic spillover effect is created. With respect to employment, employment rate increases and wage rate rises mainly in the high-growth industries in Java and Sumatra, and some of the redundant labor force of eastern Indonesia is also absorbed. Demand is also created for service industries in eastern Indonesia where income has increased through the development of resource-processing industries. A virtuous cycle of high growth and high employment is created in Java, Sumatra and east of Kalimantan, resulting in the achievement of the “high-high case”. Ensuring the sustainability of resources is an important policy issue, but considering the high growth, resource management efforts should be feasible from a fiscal perspective.

B. West High + East Low

The manufacturing industry in Java and Sumatra is competitive and drives economic growth, but growth in eastern Indonesia is sluggish. There is a growing gap between Java and Sumatra with their rising income and the slowing eastern Indonesia, and it will become more important to redistribute income from west to east. The

macroeconomic growth rate is comparatively high at 6-6.5 percent, but employment absorption does not progress with only development of capital-intensive industry, creating unemployment problems. In this scenario, together with the disparity between east and west, there is a pronounced gap between the employed and the unemployed, which is thought to increase social instability, but a response through income redistribution policy should be possible as long as a high growth rate is maintained.

C West Low + East High

The international market for the resource and resource processing industries of East Indonesia is strong, increasing external demand for eastern Indonesian industry, and resulting in a relative increase in the income of eastern Indonesia. However, distance from the production network centered on the East Asian manufacturing industry is far, and the effect of the dynamism of economic integration in East Asia is weak. Because of this, high growth does not occur when viewing the economy as a whole, and the economic structure is vulnerable to the influence of international resource market conditions. Employment absorption progresses centered on eastern Indonesia, but macroeconomic growth is sluggish at around five percent. As the dependency on resources increases in this case, growth cannot be sustained when resource management fails, creating a fragile economy. Furthermore, there is a possibility that there will be a delay in the technology transfer essential for making the manufacturing industry more advanced.

D. West Low + East Low

Growth in Java, Sumatra and eastern Indonesia is slow, weakening the growth cycle links between west and east, and lessening the sense of unity in the country as a whole. The share of the manufacturing industry in the GDP falls as low as 18 percent. Instead, the share of services, agriculture, forestry and fisheries will increase. The GDP growth rate is between 4.5 and 5 percent, making it the lowest of the four scenarios in a low-low case where unemployment is also high. This case must be avoided from the perspective of Indonesia, Japan and East Asia as a whole.

The estimates above suggest that even if only the west grows or if only the east grows, this will not create a virtuous cycle of growth → employment creation → reduced unemployment. In order to achieve a “high-high case”, growth is essential in both the east and the west. Therefore, the best development strategy for Indonesia is “two-faceted strategy by region”, i.e., differential but simultaneous growth promotion for the west and east Indonesia”, that strengthens capital-intensive industries such as the machinery industry expected to grow in Java and Sumatra, while fostering the resource processing industries that have a high economic spillover effect and employment

absorption in the underdeveloped eastern Indonesia.

6 Conclusion

6.1 Summary of Findings and Policy Implications

In this paper, we have performed quantitative analysis of growth mechanisms, employment creation mechanisms, the linkage between growth and employment, and poverty reduction strategy. A main message here is that to attain high growth, high employment and poverty reduction, a “double two-faceted strategy” comprised of a “two-faceted growth strategy by region” and a “two-faceted strategy of growth and poverty reduction” is effective for attaining the best scenario. The policy implications based on the findings in this paper are as follows and summarized in Table 11.

Table 11 Policy Implications

	Java/Bali	Sumatra	Kalimantan	Sulawesi	Nusa Tenggara	Maluku/Papua
Growth	Accumulation of capital and improvement of investment climate through public investment and improvement of infrastructure					
	Development of industry personnel through secondary and tertiary education assistance					
	Promotion of manufacturing industry (Textiles and machinery industries)		Promotion of resource processing industry (Food beverages, etc.)			
Employment	Promotion of manufacturing industry (Textiles and machinery industries)		Promotion of resource processing industry (Food beverages, etc.) Promotion of agriculture Promotion of service industry (Wholesale, retail, social service industries)			
Distribution and Poverty Reduction	Secondary and tertiary education assistance					
	Improvement of sanitation (clean drinking water and sewage systems for toilets)					
	Improved access to hospitals (especially in cities)			Improved Puskesmas (especially in villages)		
	Improvement of basic infrastructure such as sealed roads			Improvement of basic infrastructure such as sealed roads (Especially in villages)		
	Increased job opportunities for women (especially in villages)					
	Promotion of small and medium enterprises			Promotion of small and medium enterprises (especially in villages)		
	Improved access to banks					

First, it is of importance to increase investment in order to foster the growth rate of physical capital, which has significantly declined after the Asian Monetary Crisis. In so doing, establishing a sound investment climate for revitalizing infrastructure through public investment and private investment will be the key from a policy perspective. The next most important points are expanding opportunities for secondary and tertiary education, and raising labor productivity through vocational education and training.

With regard to region-based growth strategies, our findings indicate that the most

efficient way to promote growth for the nation as a whole is to promote growth in Java and Sumatra, but the growth in Java and Sumatra cannot be expected to have a substantial spillover effect on the rest of the economy. Because of this, simply improving growth in Java and Sumatra will lead to increased domestic disparity and will not generate enough employment to lower the unemployment rate for Indonesia as a whole. Aid must be simultaneously provided to areas such as Kalimantan and Sulawesi in order to reduce domestic disparity. It could be said that a “two-faceted strategy of growth by region” is required to realize the high growth – high employment scenario.

The results also revealed that the textiles industry and the machinery industry including electrical and electronic devices have a high spillover effect in Java and Sumatra, and these industries also had a relatively large and positive effect on domestic employment. On the other hand, the resource processing industry has a high spillover effect in Kalimantan, Sulawesi and other parts of Indonesia. Although not as substantial as agriculture, forestry and fisheries, these industries have comparatively large potential to absorb employment when compared to other industries. Therefore, assisting these industries could be deemed to be appropriate in terms of both growth and employment aspects.

It is believed that economic growth will reduce poverty to some degree, but direct measures to reduce poverty are required because there are groups and regions not affected by economic growth sufficiently. Effective measures for reducing poverty vary depending on whether they are nationwide or focused on a particular region. Statistical examination revealed that assisting secondary and tertiary education, making clean water available and building sewage systems such as toilets are effective measures for reducing poverty on a nationwide level. Moreover, basic infrastructure such as sealed roads is important throughout the country, but especially high effectiveness can be expected in rural areas in eastern regions such as Sulawesi, Nusa Tenggara, Papua and Maluku. The same could be said of increasing employment opportunities for women and promoting small and medium enterprises. When separating the country into East and West, it was revealed that improving access to hospitals in cities in the West and improving access to clinics (Puskesmas) in rural areas in the East are effective ways for reducing poverty. Moreover, it was also found that access to banks in the East may significantly contribute to poverty reduction.

6.2 Policy Proposal

Based on the summary findings in the previous section, we would like to set forth the direction that should be taken in Indonesia’s development strategy in the future.

First, it is essential to establish and enhance the linkage of high growth → high

employment → elimination of unemployment → poverty reduction in order to achieve sustained development in Indonesia. To do this, it will be important to adopt “a double two-faceted strategy” made up of “two-faceted strategy by region” and “two-faceted strategy of growth and poverty reduction”. How this can be achieved with limited resources will be an important policy issue for Indonesia as it becomes a more developed country.

Second, there is an urgent need to accumulate physical capital (including public infrastructure) and human capital to achieve the above objectives. These can be effective measures for both promoting growth and reducing poverty. With regard to physical capital, it will be effective to introduce foreign capital and the vitality of the domestic private sector while improving the economic infrastructure (such as market, information, transportation and urban infrastructure) required for supporting industry, and improving the socioeconomic infrastructure (such as education, sanitation, and basic urban and rural infrastructure) required for reducing poverty.

Improvement of the investment climate have been the watchwords of revitalizing the Indonesian economy in recent years, and the government overhauled the Investment Law for the first time in 40 years in 2007, announcing a comprehensive new economic policy package containing 141 items related to improving the investment climate, reforming the finance sector, developing infrastructure and revitalizing small and medium businesses. However, the domestic and foreign economic communities are calling for further improvements in the investment climate, including the taxation system and labor law. It will be necessary to make further policy efforts to improve areas such as customs, taxation and labor systems.

With regard to human resource development, fostering personnel suited to the market's needs is critically important. In this respect, targeting junior high school, high school and polytechnic schooling and introducing various training programs into them are believed to be effective.

Third, effective growth and employment strategies for each region include improving competitiveness of the textiles and machinery industries in Java and Sumatra, and promoting the resource processing industry, agriculture and the service industry in Kalimantan, Sulawesi and other parts of eastern Indonesia. Toward this, it would be effective in Java and Sumatra to make the infrastructure improvements, to establish appropriate institutions related to the investment climate and to develop human resources. At the same time, in order to increase price competitiveness, the promotion of supporting industries which allow other sectors to quickly procure cheap parts and materials will be required. Promotion of such small and medium enterprises also contributes to reducing poverty in this region. In regions east of Kalimantan, efficient utilization of resources is the key to growth. It is of great importance to promote local

industry utilizing local resources and add value to resources through such means as the One Village One Product movement and the development of small and medium enterprises. Since the development strategy of this region lies largely in resources, protecting the environment is also necessary to increase the sustainable usability of resources. Moreover, it is believed that improving financial access in rural areas will promote the One Village One Product movement and the development of small and medium enterprises. This is also an important measure from the perspective of poverty reduction.

Finally, let us touch upon the preferred distribution of resources to East and West. The analysis in this paper indicates that although the spillover effect is large in Java and Sumatra, much of this is assimilated within the same region and it is difficult for the benefits to travel to the East including Kalimantan. Meanwhile, although the impact is relatively small, the spillover effect easily travels from East to West. This suggests that putting resources into the East could also help benefit the West. However, the spillover effect in the East mainly occurs in resource-based industries. Because resource-based industries are fraught with risk (price fluctuation, resource depletion, etc.), if such industries alone grow, the economy may become more fragile in the long run. To avoid this, it is essential to provide aid for both the West and the East in order to achieve long-term economic growth.

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