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Is It Worthwhile for Indonesia to Rush into a Free Trade Deal with Japan?

Kazuhiko OYAMADA*

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Abstract

This report represents a preliminary attempt to refine some basic ideas on the potential impact Indonesia might experience from a free trade arrangement with Japan, using a forward-looking, multi-regional, multi-sectoral applied general equilibrium model of global trade to capture growth effects through capital accumulation paying attention to the changes in the patterns of interregional capital flows that might happen even before the policy change occurs. The simulation results revealed that the welfare gains of rushing into trade liberalization with Japan are not so large. This makes out that taking time over negotiations might be the best choice for Indonesia if the government places priority on convincing the Indonesian people that a free trade deal with Japan will definitely bring positive effects, while proceeding rapidly might be the answer if the country is serious about recovering the welfare levels that might be lowered by free trade arrangements among Malaysia, the Philippines, and Japan.

Keywords: applied general equilibrium; economic growth; forward-looking; free trade agreement; interregional capital flows.

JEL Classification Numbers: C68, D58, D90, F15, F41, O41.

* Research Fellow, Development Studies Center, IDE-JETRO (Oyamada@ide.go.jp)

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INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

1 Introduction

After 2002, when Singapore and Japan signed an economic partnership arrangement, the members of the Association of South-East Asian Nations (ASEAN) and Japan began to explore the possibility of forming a comprehensive Economic Partnership Agreement (EPA) that would supplement the multilateral trade system under the World Trade Organization (WTO). In November 2004, during the Asia-Pacific Economic Cooperation (APEC) Summit Meeting, the President of the Republic of Indonesia, Susilo Bambang Yudhoyono, indicated to the then Premier of Japan, Junichiro Koizumi, the importance of a bilateral EPA, that would further promote the close economic relationship between the two countries. At a routine meeting in December 2004, the Indonesian Minister of Trade, Mari Elka Pangestu, and the Japanese Minister of Economy, Trade and Industry, Shoichi Nakagawa, agreed to launch a Joint Study Group to explore the feasibility of an arrangement. After three meetings held in January through April 2005, the Joint Study Group became convinced that an Indonesia-Japan bilateral EPA covering a broad range of areas could contribute to the development of a close economic relationship between the two countries, and agreed to recommend that the leaders of both countries should start negotiations on the bilateral EPA in parallel with those on the ASEAN-Japan Comprehensive EPA that got under way in April 2005.

While Indonesia and Japan finally agreed on the framework of an EPA in November 2006, other Asian countries have also been working to establish bilateral EPAs or Free Trade Agreements (FTAs) with Japan. Malaysia and the Philippines, for example, signed agreements with Japan in July and September 2006, respectively. In addition, Thailand and Japan agreed on the main points of an arrangement in September 2005, and are now waiting for a signing that is being delayed because of the political turmoil that broke out in Thailand in September 2006. Since Indonesia is competing with these countries in the Japanese market in some product categories, such as textiles and apparel, and may stand to lose some of its share in the Japanese market, the timing of the implementation of the policy could well have an important implication for Indonesia's national interests. A problematic aspect is that the Japanese government and the Japan Business Federation (Nippon Keidanren) are urging Indonesia to move toward an early conclusion of the EPA while, for their part, the Indonesian people are not yet convinced that the pact will bring economy-wide benefits. If the Indonesian economy were to suffer adversely from the deal, or if the deal were to require some sectors to reduce output, the Indonesian government would surely be obliged to intervene, and would be unhappy with any arrangement that might be of benefit only for Japan.

The main purpose of this paper is to provide information for answering the questions: (a) what kind of economic impact would Indonesia suffer from a free trade deal with Japan; and (b) in what ways might delays in setting the terms of the arrangement alter the agreement's impact from the viewpoint of welfare gains and losses. Given the fact that Malaysia and the Philippines have already begun to outdistance Indonesia in entering into trade agreements with Japan, and taking into account the urgent requirements of policy makers for up-to-date information, this article can be seen as one of the first steps needed to form basic ideas. We approach the questions simply by simulating trade liberalization between Indonesia and Japan using a dynamic Applied General

Equilibrium (AGE) model of global trade, which is a Ramsey-Cass-Koopmans type *forward-looking* expansion of a standard Global Trade Analysis Project (GTAP, Hertel ed. (1997)) type model. This was chosen because the timing sequence is the focus of this study.

There are three kinds of potential effects that can be generated by trade liberalization: (i) direct effects from removing barriers; (ii) growth effects through capital accumulations; and (iii) effects stemming from the changing patterns of interregional capital flows. The first of these is the most basic kind of change, and is analyzed mainly by means of a static model. When a group of countries agree to the introduction of free trade, import prices of commodities from partner countries initially fall, because of the removal of trade barriers. The falls in import prices stimulate a growth of demand, and as a result, output prices of the products rise. This implies improvements of terms-of-trade against non-members of the group, with the consequence that members of the free trade arrangement may import more while exporting less, and thus be better off.

Understanding the second kind of change requires a capturing of the dynamic framework. Once a certain change occurs in the patterns of global trade, its impact may be long lasting because of changes in regional investment that cause an accumulation of capital stock. If capital accumulation is accelerated by trade liberalization, the member countries may continuously expand production to a greater extent than would be the case if no policy change were to take place. Any positive and long-lasting aspect of economic growth, such as this, cannot be overlooked.

The third type of change is the one that we would like to emphasize in this study, since changes start occurring in the patterns of interregional capital flows even before policy is implemented, especially in cases in which investors anticipate future changes in capital prices. The directions of interregional capital flows indirectly affect the trade patterns of real goods and services through current account dynamics. To capture this kind of effect, the model needs to incorporate the forward-looking decision making among households (who decide on savings) and producers (who decide on investment) may be useful. In this connection, we utilize a forward-looking dynamic model aimed at offering some insights into the potential impact of trade liberalization capturing all three of the aspects noted above. Considering that an increase in regional investment is the main engine for economic growth, it is very much in the interests of Asian countries, and the Asian region as a whole, including Indonesia, to discover how trends in the supply of foreign capital undergo change when an FTA is established. With this in mind, we believe that analyzing changes in the patterns of interregional capital flows could be informative especially for policy makers.

The following section outlines the major assumptions and the basic structure of the dynamic AGE model that is used in this study. In Section 3, we perform several sets of simulations using the model and interpret the results. Section 4 concludes the paper.

2 The Model

In this section, we outline the major assumptions and the basic structure of the forward-looking AGE model of global trade used in this study. We also present the basic structure of the benchmark data and the way the model has been

parameterized.

2.1 Major Assumptions

First, we show the key features of the model used in this study.

Multi-Sectoral, Multi-Regional Growth Model The framework is a Ramsey-Cass-Koopmans type forward-looking expansion of a standard GTAP type model, in which countries and/or regions are linked by trade and investment. The global economy is divided into the following five countries and regions: Japan (R01); Indonesia (R02); Malaysia and the Philippines (R03); the Rest of Southeast Asia (Brunei Darussalam, Cambodia, Laos, Myanmar, Singapore, Thailand, Timor Leste, and Vietnam, collectively R04); and the Rest of the World (ROW, R05). In Indonesia, textiles and apparel are two important industries which, it is expected, will achieve a significant increase in exports to Japan as a result of the bilateral EPA. Our present study will examine whether the pact will succeed in meeting these expectations. In consequence, commodities/activities are aggregated into two sectors: textiles and apparel (S01); and other industries (S02)[1]. Economic growth is led by the exogenous growth of labor input and Total Factor Productivity (TFP). Since the model is calibrated on the assumption that the benchmark data are obtained from the global economy in a steady state, we concentrate on analyzing qualitative dynamic effects of the policy changes.

Perfect Competition The model is essentially based on the traditional neoclassical growth theory and its solutions can therefore be regarded as the result of perfect competition with Constant-Returns-to-Scale (CRS) production technologies. Since our purpose in this study is to obtain a preliminary approximation, neither imperfect competition nor biased information is considered on this occasion, and the simulation results may be interpreted as giving only a potential picture of a hypothetical economy under conditions of perfect competition, so that we can abstract fundamental determinants of economic growth. When one assumes monopolistic or oligopolistic scale economies, the impact of policy changes may be magnified. In this regard, it can be said that results from the simulations in this study depict types of lower-bound estimates.

Primary Factors The labor force is assumed to be immobile beyond the regional boundaries. In contrast, investment capital flows across countries and/or regions (foreign capital inflow/outflow), and its net flow is determined so as to balance the current account of each country and/or region. It is assumed that representative consumers in every country/region invest proportions of their income through the interregional capital market, and the model does not distinguish long-term from short-term capitals[2]. Furthermore, as it is based on the

[1]The main purpose of this sector disaggregation is to capture the spillover effects through intermediate transactions. Sector specific production patterns, such as those that Roe and Saracoglu (2004) consider important, are not taken into account in this study.

[2]To explicitly handle long-term capital movements such as Foreign Direct Investment (FDI), modeling the behavior of multinational firms may bring the best solution. This means including such features as the fixed costs of establishing new subsidiaries, as has been done in the excellent study by Markusen (2002). This task is left as a possible future extension of our model.

GTAP framework, the model does not track ownership of capital so that the source-destination relationship in investment is left ambiguous. We capture the trend in interregional capital movements by the regional shares occupied in the global total of investment. It is important to note that full employment of labor is assumed and plays an important role in performing simulations. Itakura *et al.* (2003) suggest that the investment capital may flood into particular regions in the early stages of a trade-related policy change simulated by a model that assumes full employment. Since the welfare levels are very sensitive to interregional capital movements in the general equilibrium framework, the simulation results may present extreme pictures.

Exchange Rates Exchange rates for the currencies of individual countries/regions do not enter into the model's equations. In a monetized extension of the model, an explicit function of demand for money in each country/region is specified and a particular regional money stock determines the monetary equilibrium. Such a specification, however, will reveal the classical dichotomy between real and monetary phenomena, as often presented in neo-classical macroeconomic theory. This dichotomy implies that behavior on the real side of the economy is independent of monetary conditions and that the monetary side alone determines the price of money in terms of goods[3]. Relative commodity prices therefore remain unchanged if the money stock changes, and the absolute price level is determined by the money stock alone once real-side behavior is determined. Since the model used in this report is a real-side trade model, the issue of the determination of exchange rates does not arise.

Dynamic Consistency The economic agents' inter-temporal behavior is assumed to be rational, so that the entire system of prices over time is internally consistent. This is because the model calculates all of the variables in every period at the same time. Consumption and investment are determined on the basis not of what happened in the past, but of the assumed future conditions of technology, preference, and policy changes. Changes in the future exogenous variables may affect present endogenous variables.

Discrete Time Formulation For the purpose of numerical implementation, the inter-temporal problem is formulated in discrete time. Discounting in discrete time requires a dating convention. In order to keep the derivation and parameterization simple, all transactions are assumed to take place at the end of the period (while decisions are made or planned at the beginning of the period), following Devarajan and Go (1998).

2.2 Dynamic Modeling

We then proceed to present the basic structure of the model used in this report, focusing on the model's dynamic side. The model is an extension of a typical static global trade model, such as that presented by Hertel ed. (1997), with Ramsey-Cass-Koopmans type forward-looking properties. So, a transaction system similar to the GTAP model is adopted in the modeling of interre-

[3]Considering that a price adjustment process takes time, a monetary shock may affect the real market in the short-run.

gional trade in goods and services. For instance, the model assumes imperfect substitution between domestically produced commodities and imports, known as the Armington assumption (Armington (1969)), to accommodate cross hauling observed in the benchmark data. In the following, subscripts j, r, and t denote commodities/activities, countries/regions, and time period, respectively.

Producers There is one competitive producer in each sector for every country/region, who produces one kind of product. Production and factor inputs are all determined endogenously so that resources are optimally used from the viewpoint of a maximization of net income. Factor substitutability is assumed among labor, capital, and intermediate input. Note that we assume that nested factor inputs in the production and technologies in all sectors exhibit CRS. Given the initial capital stock, interregional rate of return and prices of primary factors, composite intermediate good, raw capital, and output, the dynamic decision problem of the producer is to choose a time path of investment that will maximize the value of the firm, defined as the discounted sum of temporal net cash flow yielded in every period. Investment comprises raw capital, and is equipped to form the capital stock of each country/region. Inventory is included in the investment.

The producer's optimization problem is as follows:

$$
\begin{aligned}
\text{Max} \qquad & VF_{jr} = \sum_{t=1}^{T} \left(\prod_{v=1}^{t} \frac{1}{1+RI_v} \right) R_{jrt} \\
& \qquad + \left(\prod_{t=1}^{T} \frac{1}{1+RI_t} \right) PKT_{jr} K_{jrT} \\
\text{s.t.} \qquad & K_{jrt} \leq A_{jrt-1} + (1-\delta_{jr}) K_{jrt-1} && (1) \\
& Y_{jrt} \leq \text{CD}\left(K_{jrt}, L_{jrt}\right) && (2) \\
& Z_{jrt} \leq \text{CES}\left(Y_{jrt}, QH_{jrt}\right) && (3) \\
& \delta_{jr} K_{jrT} \leq A_{jrT} && (4)
\end{aligned}
$$

where:

VF_{jr} is the value of the j-th firm in Region r,

Z_{jrt} is j-th gross output in Region r,

Y_{jrt} is j-th value added in Region r,

K_{jrt} is j-th capital stock in Region r,

L_{jrt} is j-th labor input in Region r,

QH_{jrt} is j-th composite intermediate input in Region r,

A_{jrt} is raw capital installed to be j-th capital in Region r,

RI_t is interregional rate of return,

PKT_{jr} is price of j-th capital in Region r at the time period $t = T$,

R_{jrt} is current net cash flow (the subtraction of costs and investment from sales) of j-th firm in Region r,

δ_{jr} is physical depreciation rate for j-th capital in Region r,

$\mathrm{CD}(\cdot)$ shows the function is of Cobb-Douglas type, and

$\mathrm{CES}(\cdot)$ shows the function is of CES type.

First order conditions derived from this producer's optimization problem formulate the investment side of the dynamics in the model.

The second term of the right hand side of the objective function is the present value of the j-th firm in Region r at the time period $t = T$, which must be zero when $T \to \infty$ as the transversality condition. This value of capital is returned to the household at the end of the time period $t = T$, and finances the series of final consumption after the time period $t = T + 1$ as the non-human wealth along with the human wealth. Following the usual procedure, the steady state condition (Equation (4)) is imposed at the terminal period. Since the choice of the terminal period T determines the approximation accuracy of the model, T should take a sufficiently large value to make the second term of the right hand side of the objective function close to zero, being reconciled with the limited availability of computational resources. We set the terminal period at $T = 50$.

In capital installation, we utilize the Uzawa-Penrose function, which defines the relation between quantity of investment and installable new capital, respectively per unit of capital stock[4]. It is assumed to take the following quadratic form:

$$\frac{QF_{jrt}}{K_{jrt}} = \alpha_{jr}\left(\frac{A_{jrt}}{K_{jrt}}\right) + \frac{\beta_{jr}}{2}\left(\frac{A_{jrt}}{K_{jrt}}\right)^2 \tag{5}$$

where:

QF_{jrt} is fixed capital formation by j-th firm in Region r.

Equation (5) shows that adjustment cost, QF_{jrt} minus A_{jrt} (times the price of the investment good), is needed to set up the investment good to be installed as capital, and the cost of one unit of investment declines when capital accumulation proceeds[5]. This implies that rapid capital accumulation needs more capital installation cost, and as a result, desired levels of capital stock are attained gradually with instantaneous changes in the rate of return.

Furthermore, incorporating adjustment cost in capital installation gives the producer's optimal choice of investment a positive meaning. In cases where there is no adjustment cost, the model essentially solves an optimal accumulation path of capital stock so that the levels of investment in every period are derived in a passive manner. Its process is just equivalent to solving a static cost minimization problem instead of solving a dynamic one. In contrast, the optimal levels of investment are determined first with the presence of adjustment cost, then capital is accumulated as a result. In consequence, a producer's expectation on the future economic condition affects her/his investment plan through the price of capital when there exists an adjustment cost, while a shock in any future period does not have any direct influence without the cost.

[4]See Uzawa (1969).

[5]The first term in the right hand side of (5) can be regarded as the fixed cost for allocating resources or forming plans to carry out investment. For those who are concerned about adjustment cost, $\alpha_{jr} < 0$ applies when negative investment takes place for the case in which a producer or firm intends to sell equipments or facilities to reduce production volumes. See Abel and Eberly (1994).

Households Given the interregional rate of return, the composite price of commodities for final consumption, and regional wealth, the representative consumer in each country/region chooses a time path of savings that maximizes her/his discounted utility of the temporal sequence of aggregated consumption. The utility function is homogenous and additively separable with constant elasticity of marginal utility. The utility is discounted by the representative consumer's positive and constant rate of time preference. Since the financial claims are perfect substitutes *ex ante*, we cannot uniquely determine the individual consumer's optimal portfolio shares. However, since the goods are imperfect substitutes, interregional capital market equilibrium conditions define the foreign borrowings/lendings for each region endogenously. The model treats capital flows as equal to the balance of trade, adjusted for debt-service payment/receipt, and the stream of debt-service payment/receipt arising from an increase in foreign borrowings/lendings is incorporated into the household's decision making. Without uncertainty and with efficient capital markets, financial assets among countries/regions earn the same anticipated rate of return.

The household's optimization problem can be expressed as follows:

$$\begin{aligned}
\text{Max} \quad & U_r = \sum_{t=1}^{T} \overline{L_{rt}} \left(\frac{1}{1+\rho_r}\right)^t \frac{1}{1-\sigma_r} \left(\frac{QC_{rt}}{\overline{L_{rt}}}\right)^{1-\sigma_r} \\
\text{s.t.} \quad & \sum_{t=1}^{T} \left(\prod_{v=1}^{t} \frac{1}{1+RI_v}\right) PQC_{rt} QC_{rt} \\
& \qquad \leq \sum_{t=1}^{T} \left(\prod_{v=1}^{t} \frac{1}{1+RI_v}\right) \sum_j (R_{jrt} + PL_{rt} L_{jrt}) \\
& \qquad + \left(\prod_{t=1}^{T} \frac{1}{1+RI_t}\right) B_{rT} - \overline{B_{r1}} \qquad (6) \\
& B_{rt} = FS_{rt-1} + (1+RI_t) B_{rt-1} \qquad (7) \\
& -RI_T B_{rT} = FS_{rT} \qquad (8)
\end{aligned}$$

where:

U_r is utility level in Region r,

$\overline{L_{rt}}$ is labor supply in Region r,

QC_{rt} is composite consumption in Region r,

PQC_{rt} is composite price of consumption good in Region r,

PL_{rt} is price of labor in Region r,

B_{rt} is foreign debt position of Region r,

FS_{rt} is current foreign savings of Region r,

ρ_r is subjective discount rate in Region r, and

σ_r is the inverse of the elasticity of inter-temporal substitution in Region r.

In a similar way to the investment side of the dynamics, first order conditions derived from the above optimization problem formulate the savings side in the model.

Note that the model implicitly assumes that the series of consumption in the post-terminal period $t \geq T + 1$ is financed by the value of capital, which is returned from producers at the end of the time period $t = T$ (the second term of the right hand side of the producer's objective function), and the human wealth earned in the post-terminal period. In this assumption, the transversality condition for the representative consumer's maximization problem is satisfied.

Making a pair with the steady state condition on the investment side, Equation (6) defines a current account equilibrium that debt-service receipt/payment is equal to the net imports/exports. This implies that trade imbalances are allowed in a steady state. Since the stream of debt-service receipt/payment is incorporated into the representative consumer's decision making, Equation (6) functions like the so-called No Ponzi-Game condition. As long as the terminal conditions are satisfied, the sums of various series pertaining to the investment equation and the savings function will be finite and well defined.

2.3 Benchmark Data

The data source for the model is the GTAP version 6 database. A fixed proportion of services output, which is included in S02 in this analysis, is supplied for interregional shipping services. The original 87 countries/regions and 57 commodities/activities are aggregated to five and two, as noted in the previous section. Assuming that the data is obtained from an economy in a steady state, parameters and exogenous variables are calibrated from the data.

Basics of the GTAP Data The GTAP version 6 database basically is a set of regional input-output tables and sectoral trade flows connecting sectoral exports and imports that appear in the input-output tables, plus several kinds of estimated elasticity. The target year is 2001. There are four sheets of trade-flow data, which are respectively presented at wholesale prices, FOB prices, CIF prices, and protection-inclusive market prices. The differences among these four sheets consist of *ad valorem* equivalent domestic transportation margins and export subsidies, international shipping margins, and import tariffs, import quotas, antidumping duties and non-tariff barriers. Note that we collectively handle the latter four (import tariffs, import quotas, antidumping duties, and non-tariff barriers) as a single item to be removed in the simulations performed in this report.

Behavioral Parameters Some of the behavioral parameters used in this analysis, such as the set of substitution elasticity for the CES aggregators, are the weighted average of the values provided by the GTAP database. The substitution elasticity for the commodities from different countries/regions is on the assumption of the so-called *Rule of Two*. The elasticity of inter-temporal substitution in the representative consumer's utility function is set low for the countries/regions in Southeast Asia while Japan takes the highest value. In consequence, the reciprocals of the elasticity are assumed to be 1.20 for R01 (Japan), 1.60 for R05 (ROW), 1.80 for R02 (Indonesia) and R03 (Malaysia and

the Philippines), and 2.00 for R04 (the rest of Southeast Asia)[6]. The scale parameters in the Uzawa-Penrose function, α_{jr} and β_{jr}, are respectively set to 2.0 and 2.6 that are identical to all producers/firms in every country/region. While we divert the values obtained by Asako and Noguchi (2002), which were estimated from the financial statements of the 435 companies listed on the Tokyo Stock Exchange, for all of the countries/regions included in the model, we need further research on this subject[7]. In order to obtain a steady growth path as the base case, the economic growth rate should be equal among regions. While it is unrealistic to assume identical economic growth rates for each region, we assume zero growth with the 8 percent interregional interest rate in order to focus on the qualitative dynamic analysis of policy changes. With the parameters listed above, others are all calibrated from the benchmark data to reproduce the initial equilibrium in a steady state, with the global economy following a balanced steady growth path. In a normal case, this steady growth path is regarded as the reference run, which measures the impact of policy changes simulated.

3 Simulations

We now report on the results of simulations, categorized into two types, performed in this forward-looking framework. In the first type, we examine the effects of trade liberalization between Indonesia (R02) and Japan (R01), on the assumption that Malaysia and the Philippines (R03) also settle free trade arrangements with Japan. In this type of the experiment, both R01-R02 and R01-R03 free trade programs are assumed to be introduced simultaneously in the 6th period, taking the R01-R03 case as the benchmark scenario. In the second type, we examine how the results obtained by the first type change, from the view point of welfare gains and losses, when Indonesia takes time to conclude negotiations with Japan in circumstances in which Malaysia and the Philippines go ahead in tying up agreements with Japan. In this type, we compare results by simulating a one or two year delay in R01-R02 liberalization of trade (the policy change happens in the 7th or 8th period) with the one from the former simulation.

In the experiments, trade liberalization is expressed as the permanent removal of trade barriers. A feature of this study is that we incorporate the announcement effects of the policy changes that are fully anticipated by economic agents as being likely to happen at some time during the several periods ahead. The terminal period in the model is set at 50.

3.1 Initial Trade Patterns and Barriers

Before we see the simulation results, let us consider the initial patterns of trade and the existing barriers that are to be removed in the experiments. Table 1

[6]The reciprocals of the elasticity of inter-temporal substitution can be regarded as coefficients that show relative risk aversion in a separable utility function such as used in this study. We chose the parameter values considering the information provided by Kaneko (1991) and Uemura (2002). Devarajan and Go (1998) assume 0.9 for the Philippines, although the source is not clear.

[7]In their analysis of the Filipino economy, Devarajan and Go (1998) simply assume $\alpha = 1.0$ and $\beta = 0.0$ as in Bruno and Suchs (1985).

Panel A: Export Side (FOB Prices)

	R01	R02	R03	R04	R05	World
R01	0.00	17.90	12.16	10.50	5.66	5.72
R02	1.47	0.00	1.05	2.11	0.51	0.63
R03	4.68	4.37	1.52	9.20	1.16	1.68
R04	6.63	10.35	16.54	7.46	2.21	3.08
R05	87.22	67.38	68.73	70.73	90.46	88.89
Total	100.00	100.00	100.00	100.00	100.00	100.00

Panel B: Import Side (CIF Prices)

	R01	R02	R03	R04	R05	Total
R01	0.00	3.24	5.04	5.74	85.99	100.00
R02	15.26	0.00	3.97	10.64	70.14	100.00
R03	18.22	2.67	2.13	17.13	59.85	100.00
R04	14.11	3.41	12.69	7.66	62.13	100.00
R05	6.42	0.78	1.83	2.49	88.49	100.00
World	6.54	1.03	2.37	3.14	86.93	100.00

Table 1: Share of Trade Partners (%, 2001)

shows relationships among countries/regions for 2001 with regard to both exports and imports. In the table, each country/region labeled in the top row is the source of trade flows while the destinations are shown in the left column. R04 and R05 denote the rest of Southeast Asia (Brunei Darussalam, Cambodia, Laos, Myanmar, Singapore, Thailand, Timor Leste, and Vietnam) and the rest of the world (ROW), respectively. Despite the small differences that exist between values calculated at FOB and CIF prices, those listed in the right column indexed "World" in Panel A show approximately how much each country/region imports in the global total. Similarly, exports from every country/region as proportions of world exports are shown in the bottom row in Panel B.

One important point needs to be noted as regards the economic characteristics of Malaysia and the Philippines (R03). In contrast to Indonesia (R02), these countries depend quite heavily on trade. While the total volume of private consumption in the two countries is about 80% of that in Indonesia, the region boasts levels of exports and imports that are 2.5 times greater than private consumption[8]. Thus, Malaysia and the Philippines export twice and import 1.8 times the volume of private consumption. Consequently, effects of a trade related policy change implemented by Malaysia and the Philippines would be much greater, whether positive or negative, than a policy change implemented by Indonesia.

Table 2 shows the *ad valorem* equivalent protection rates for 2001 levied on sectoral trade flows from the source countries/regions (appearing in the top row) to the destination countries/regions (appearing in the left column). S01 corresponds to textiles and apparel while S02 shows the other industries. The values

[8]The tax-exclusive volumes of private consumption in 2001 are 87,382.99 and 70,173.64 million U.S. dollars respectively for Indonesia and the total of Malaysia and the Philippines. The levels of the fixed capital formation are 22,972.22 and 25,989.28 million U.S. dollars.

		R01	R02	R03	R04	R05
R01	S01	0.000	5.994	6.497	7.846	9.198
	S02	0.000	0.983	0.552	5.467	4.015
R02	S01	5.711	0.000	4.893	4.530	9.286
	S02	5.271	0.000	2.810	3.727	2.870
R03	S01	7.383	8.091	9.288	7.896	9.715
	S02	5.402	6.012	2.802	3.589	3.375
R04	S01	22.433	8.268	3.450	5.667	14.072
	S02	5.213	3.744	2.008	6.688	3.366
R05	S01	16.916	15.976	12.767	12.726	7.781
	S02	4.708	6.429	3.584	4.382	2.608

Table 2: *Ad Valorem* Equivalent Protection Rates (%, 2001)

of protection are obtained by subtracting the trade flows at CIF prices from those at protection-inclusive market prices. Specifically, these margins include import tariffs, import quotas, antidumping duties, and non-tariff barriers. As we noted previously, we collectively handle them in the simulations as barriers to trade.

As a precondition for the analysis of trade liberalization between Indonesia and Japan, we simulate a case in which Malaysia and the Philippines liberalize trade with Japan in the 6th period, those countries having already concluded negotiations and signed the agreements so that the policy can be regarded as effective. We take this case as the benchmark case. In this reference run, the values in Table 2, which correspond to both R01 and R03, are replaced by zero[9]. While we will not include the possibility of Indonesia not taking any action, since it lies out of our focus, most of the effects of the liberalization of trade between Indonesia and Japan are measured by deviations from the values obtained in this reference case.

3.2 Dynamic Effects of Liberalizing Trade between Indonesia and Japan

In this subsection, we focus on the dynamic effects of liberalizing trade between Indonesia and Japan. In a static framework, output prices of the commodities produced in countries/regions involved in a free trade program tend to rise relative to the global average of output prices. The high output prices of products in the member countries in comparison with those in non-members improve the terms-of-trade, and enable the members to be better off. Under the condition of low price distortion and the resulting improvement in the efficiency of intra- and interregional resource allocation, trade diversion may occur, and as a result, the economic importance of member countries may increase within the global economy through the expansion of production. Such a growth effect amplifies the static impact through capital accumulation in a dynamic framework.

In a framework of forward-looking dynamics, the price of capital plays an important role. Changes in capital prices triggered by a static shock will lead to

[9]Those values in percentage terms are 6.497 and 0.552 for the protection by Japanese, and 7.383 and 5.402 by Malaysia and the Philippines.

movements in the patterns of interregional capital flows even in the period before the policy change, and will be followed by changes in interregional trade in goods and services. The effects of changing patterns of interregional capital flows are of crucial importance for the global economic situation. When it is announced that a policy change, such as trade liberalization, is to be implemented within a certain future period, the expected static impact and subsequent growth effects raise capital prices in the member countries involved in the agreement relative to those in non-members[10]. Thus, the effects of future trade liberalization program become apparent in the period before its actual implementation through changes in the patterns of interregional capital flows, and the existence of price distortions is inherent in the impact before and after policy implementation. In the pre-implementation period, changes in capital prices affect the allocation of regional investment, and at the same time, affect the behavior of real markets through changes in output prices.

Another important factor that determines the dynamic growth paths of countries and regions is the foreign debt/asset position. An increase in foreign capital inflow, brought by raised capital prices or increased net imports, may enable a country and/or region to improve welfare levels through an expansion in the volumes of production and consumption. On the other hand, an inflow of foreign capital of this kind may help to cause a deterioration in the foreign debt/asset position and may increase or decrease the burdens or benefits of interregional interest payments or receipts. For this reason, not every country or region will continue to accept net inflows of foreign capital over a long period.

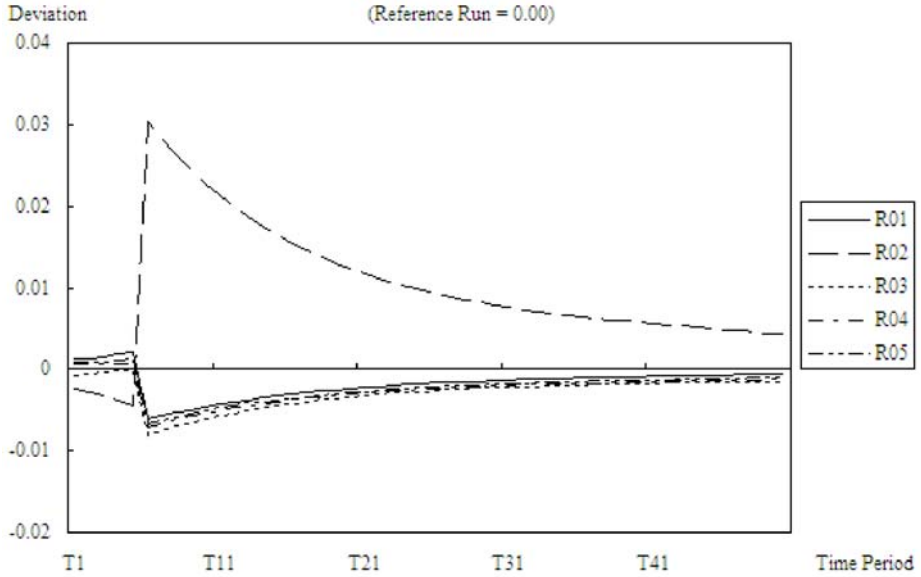

Figure 1: Effects on Regional Share of Investment

[10]Capital price may be translated into stock price. When expected future earnings of a firm increase, the value of the firm rises, and as a consequence so does the capital price. Capital price times interregional rate of return in the model forms dividend and earnings retained in a firm awaiting its next investment.

Figure 1 shows the dynamic effects of trade liberalization between Indonesia and Japan in the 6th period, on the assumption that Malaysia and the Philippines also settle free trade deals with Japan in the same time slot, on regional shares of investment. As we noted earlier, we measure the effects by deviations from the benchmark case in which Indonesia does not take action under the same conditions as those applying to Malaysia and the Philippines. It is clear that Indonesia increase the share of regional investment by 3% in the period when it reaches an FTA with Japan. In this scenario, Indonesia gradually reduces the volume of investment in the period after the policy is implemented, while its new steady state level is higher than in the reference case. Contrary to the post-implementation period, the share of investment in Indonesia declines below the level in the benchmark case. These changes exhibit a pattern that is completely opposite to that in the cases of the other countries and regions.

The four countries and regions other than Indonesia follow similar paths of regional investment in that they slightly expand the shares before policy implementation but then undergo sudden falls and recoveries over the post-implementation period. In this regard, two points need to be noted. One is that Japan has an advantage over the other three countries/regions in that the rate in enlargement/shrinkage of the regional investment is always is greater or less than before. Another point is that regional investment in Malaysia and the Philippines never exceeds its level in the reference run. A possible explanation of these two points is that Japan receives the benefit, although it is small, from the free trade program with Indonesia while Malaysia and the Philippines might be rivals to Indonesia in the Japanese market. The reason why the four countries/regions follow similar patterns is because the changes in the Japanese investment level affect the production volumes of Japanese firms, as well as output prices, and then exert a spillover effect on the other countries/regions through interregional trade.

Let us now consider why the direction of the investment flow changes from Japan to Indonesia once the policy becomes effective, in spite of the likelihood that the expected return in the both two countries will increase in a similar manner. To find a pointer toward the answer of the question, let us look at Figure 2, which captures the effects on the time paths of foreign savings by country/region. Since the initial foreign savings are negative for R01 through R04 (investment capital outflows from the country/region) and positive for R05 (foreign capital inflows), the values above the line imply greater negative values for the former groups and positive for the latter. If the values fall below the zero line, foreign capital turns to inflow into the country or region if and when this is the case for R01 through R04.

Notice that Indonesia (R02) greatly increase foreign savings just after liberalizing trade with Japan, and savings turn negative again around the 15th period. This implies that Indonesia repays the borrowings from foreign countries/regions, which are inflated during the period just after the policy change happens, in the latter half of the simulation period. Since the foreign debt burden may become prohibitively heavy if a country or region successively receives foreign capital, as mentioned earlier, it might be and efficient choice for investors to start intensive investment in Indonesia and promote rapid capital accumulation, after the price distortions are reduced and smoother transactions in trade are enabled by the free trade program. The attractiveness of this strategy is also supported by the initial trade patterns shown by Table 1. Since the shares

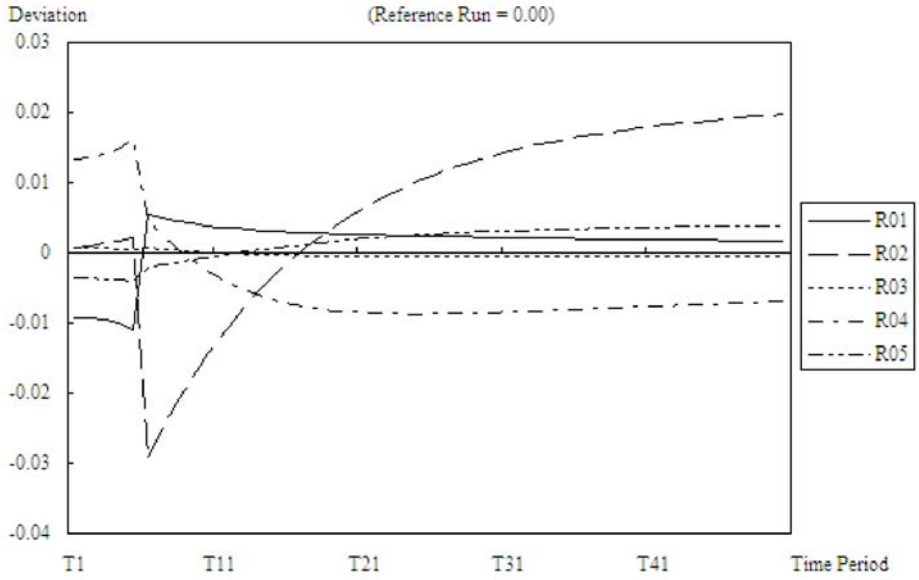

Figure 2: Effects on Foreign Savings

of Japan in Indonesian exports and imports are larger than those of Indonesia in the Japanese ones, the proportion of the benefit brought by the free trade program to the economic volume would be much greater for Indonesia than for Japan. Hence, from the investor's point of view, the optimal choice is to invest in Japan in the period before the free trade program takes place, altering the target to Indonesia once the environment in which the country can be grow most efficiently is established by the policy change. It should also be pointed out that efficient economic growth may help the country to complete repayment of its foreign borrowings within a short period.

During the period in which that the Indonesian economic growth gets on the right track and the country begins to start repaying its foreign borrowings, foreign capital changes its destination once again to the rest of Southeast Asia (R04) and to the ROW (R05). This is because the previous economic growth of the countries and/or regions involved in the free trade programs has a spillover effect on non-members through interregional trade transactions, and leads to an expansion of production volumes. However, regional investment in the non-members has previously been reduced to levels below the benchmark case, and they never recover the production volumes to the reference levels.

Let us now identify the dynamic effects on Indonesia's volumes of exports, imports, and outputs. The time paths of Indonesian exports and imports shown in Figure 3 reflect the trend of foreign savings discussed above. Basically, Indonesia finds the source of its economic growth in the foreign capital that flows into the country. Therefore, the rate of change in imports exceeds that of exports so that the current account balance of the country is kept negative. The new steady state levels of exports and imports grow by 2.5% with respect to the reference case. As the country accumulates capital stock utilizing investment from overseas, the volume of outputs expands by 0.5%. On the other

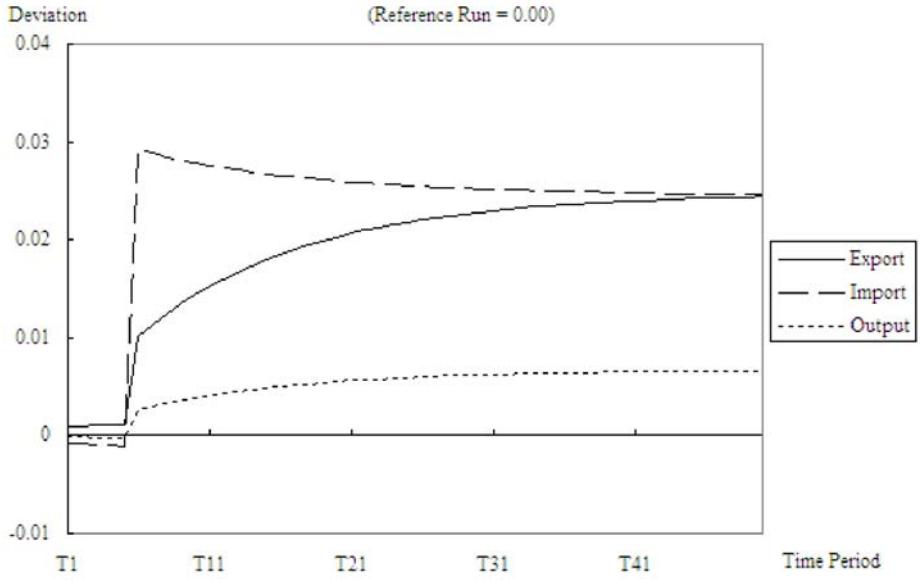

Figure 3: Effects on Commodity Markets

hand, the flow of foreign capital leaves Indonesia and heads toward Japan in the pre-implementation period. Hence, the volumes of imports and outputs shrink before the free trade program is initiated.

Figure 4 captures the effects of trade liberalization between Indonesia and Japan on the time paths of sectoral value-added output by Indonesian industries. Since the initial volumes of the two sectors, the textiles and apparel (S01) and the others (R02), in 2001 amounted to 5,108.01 and 130,116.60 million U.S. dollars (3.78% and 96.22% of the total GDP), respectively, the decrease in the output volume in the period before the policy change that we saw previously occurs in other industries, too. On the other hand, in the textiles and apparel industries, labor input takes the place of decelerated capital accumulation to help keep production at a high level even in the pre-implementation period. Once the free trade policy is imposed, movement of labor from other industries to textile and apparel accelerates, expanding the production volume by more than 3%.

3.3 Welfare Effects of Delays in Action to Settle a Free Trade Deal

In this subsection, we examine how the welfare level is affected when Indonesia takes time before settling a free trade arrangement with Japan. Figure 5 shows the dynamic effects on the consumption levels of Indonesian representative households in three cases: Case 1, in which Indonesia-Japan free trade is initiated just in time for the liberalization of trade between Malaysia and the Philippines and Japan - the policy change happens in the 6th period; Case2, in which liberalization is delayed by one year - the 7th period; and Case 3, in which liberalization is delayed by two years - the 8th period. It is apparent

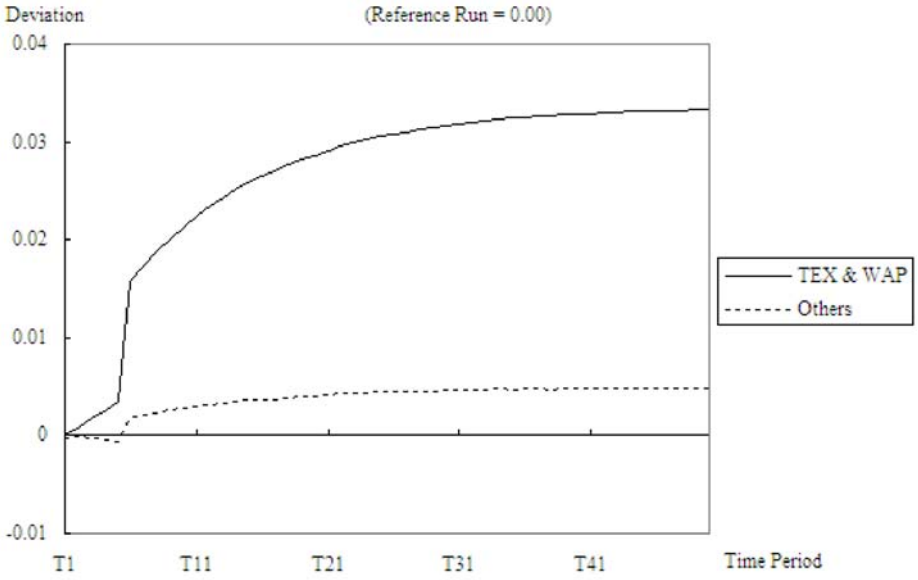

Figure 4: Effects on Sectoral Value-Added

that the levels of private consumption in the country deteriorate for several years following the policy change. Such reductions in consumption might be brought about in two ways. The first possibility is that production volumes in the country are reduced by discouraged investment, as we saw previously, so that the total size of the pie, to be eaten, exported, or used to form capital, becomes smaller. The second possibility is that the representative consumers increase savings within their limited budget to finance regional investment in a situation in which foreign capital tends to leave the country and flows into Japan. This is because, as the volume of foreign capital inflow decreases, the country imports less or exports more so that the total supply is reduced in the market for regional consumption.

Subsequently, there are time-lags in the recovery of consumption levels after investment in the country is encouraged by trade liberalization. The reason is that it takes time to accumulate capital stock because of the existence of various adjustment costs and time is needed to hook up the expansion in investment volumes to economic growth. In this regard, the speed of recovery can be accelerated if one assumes lower values for the scale parameters in the Uzawa-Penrose function. In addition, the changes in the dynamic paths of consumption are not so sensitive in comparison with the case when the elasticity of inter-temporal substitution in consumption is set at a high level. In such a case, the representative households flexibly adjust their consumption-savings ratio against any shock and its subsequent effects so that one may observe a sharp leap or drop in the dynamic path of consumption.

It is apparent that, the earlier Indonesia reaches an FTA with Japan, the higher the new steady state level of private consumption. Since the recovery process in Case 3 starts late, a delay in taking action to conclude negotiations may bring welfare loss compared to other cases. Figure 6 shows the welfare

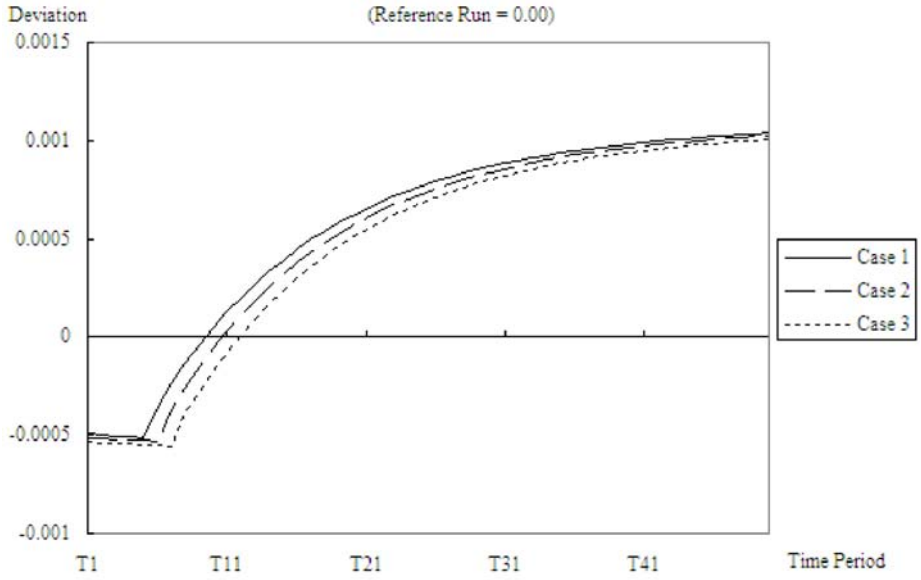

Figure 5: Effects on Private Consumption

gains by Indonesia in the four cases including the benchmark, in which Indonesia does not decide to start liberalizing trade with Japan while Malaysia and the Philippines do, and three cases, in which Indonesia reaches agreement in any one of the 6th, 7th, or 8th periods, measured by the income level achieved in the case in which nothing happens at all. We derive these welfare gains based on the idea of Hicksian Equivalent Variations (EVs). EVs are the amount of money equivalent to the changes that have already taken place in the situation where there is no policy change. In other words, there are the income changes that take the representative households to post-shock welfare levels. In this dynamic framework, we calculate the discounted sum of temporal EVs obtained in every period.

Let us start with the benchmark case. In cases where there are parallel free trade programs among Malaysia, the Philippines, and Japan, Indonesia suffers from a welfare loss reaching 4,000 million U.S. dollars in 2001 prices. This is because, as we mentioned earlier, the proportion of the trade sector in the Malay and Filipino economies is much greater than the one in Indonesia so that volumes of the effects of the trade policies taken by Malaysia and the Philippines on the interregional economic relationships become considerably larger than in the case of Indonesia. In addition, since Indonesia might be competing with Malaysia and the Philippines in the Japanese market, some of the shares of Indonesian products would possibly be replaced by tariff-exempted cheaper products from the other two countries.

It is clear that taking fast action to liberalize trade enables Indonesia to avoid a lowering in the nation's welfare level that would be caused by free trade among Malaysia, the Philippines, and Japan, while its volume remains small. The large difference in the volumes between the positive effects, which Indonesia gains from the trade liberalization with Japan, and the negative effects, which the

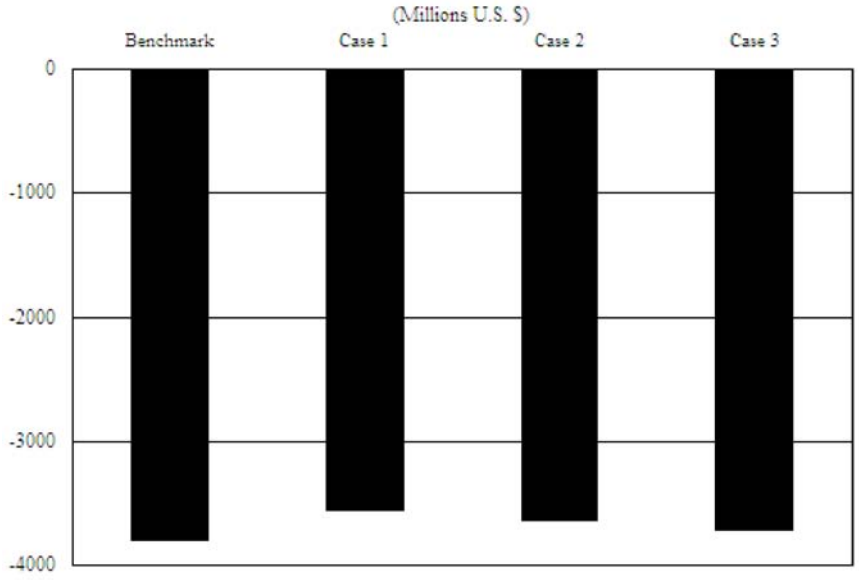

Figure 6: Welfare Gains

country suffers in the case of Malaysia and the Philippines reaching agreement with Japan, mainly comes from differences in the levels of dependencies on trade and the initial shares of the countries in the Japanese market. If avoiding welfare loss is set as the most important priority for Indonesia, taking fast action toward reaching an FTA with Japan may be the best option. On the other hand, if Indonesia sets as its main priority the achievement of national consensus on the formation of an FTA with Japan, taking time to gather enough information might be the best way forward since the welfare gains from rushing into an agreement are insufficient to retrieve the loss that is apparent in the benchmark case.

4 Concluding Remarks

The purpose of this report has been to make a preliminary attempt to offer some basic ideas on the potential impact Indonesia might experience from the achievement of a free trade arrangement with Japan. In our analysis, a forward-looking AGE model of global trade has been utilized to capture growth effects through capital accumulation, with particular reference to the changes in the patterns of interregional capital flows, which might occur even before the actual policy change is introduced.

Simulations with the model have revealed the anticipated response of the global economy to the additional liberalization of trade between Indonesia and Japan, which currently is in the negotiation stage, in circumstances in which Malaysia and the Philippines also reach an FTA with Japan. The key findings can be summarized as follows:

1. Investment capital flows into Indonesia and promote efficient economic

growth through rapid accumulation of capital stock in the period after the price distortions are reduced and smoother transactions in trade are made possible by the free trade program.

2. Since a continuous receipt of foreign capital may exponentially increase its foreign debt burden, Indonesia starts repaying its borrowings once the country gets on to a fast growth path so that the stream of investment capital changes its destination to the rest of Southeast Asia and the ROW, as a result of the spillover effects of the preceding economic growth of the countries/regions involved in the free trade programs.

3. Since the welfare gains of rushing into trade liberalization with Japan are not so large, taking time over negotiations might be the best choice for Indonesia if the government places priority on convincing the Indonesian people that a free trade deal with Japan will definitely bring positive effects, while proceeding rapidly might be the answer if the country is serious about recovering the welfare levels that might be lowered by free trade arrangements among Malaysia, the Philippines, and Japan.

There are several potentially important issues that we have not been taken into account in our analytical framework. First, the parameterization of the model, which assumes that the benchmark data are obtained from the global economy in a steady state, is quite unrealistic. Since the Asian economies are still in the process of growing at high rates, it is in real terms appropriate to regard the global economy as being on a dynamic adjustment path. In addition, calibrating the model to a steady state rests on another unrealistic assumption in the form of the derivation of initial net foreign assets. In this regard, it is urgently necessary to develop a procedure to calibrate the model to a point on the economic growth paths of every country/region involved in the analysis.

Second, the model does not distinguish long-term from short-term capital. Since long-term capital, such as FDI, may be essential for economic growth, making efforts to include decision making on investment by multinational firms is important. The first step in this direction would be the incorporation of increasing returns and imperfect competition.

Third, trade-related policy measures may affect the fiscal conditions of a government which change the levels of tax revenues. In this regard, it is important to capture the roles of government, and especially those that may support economic growth.

Finally, this is an essentially a pilot study, and a more detailed analysis is clearly needed. In its issue dated February 9, 2007, the *Jakarta Post* reported that the negotiations are due to be concluded by the end of March, 2007, assuming a continuation of present conditions. Upon completion, Japan is going to reduce the levels of import tariffs on Indonesian products by more than 90%, while Indonesia is planning immediate removals of the present tariffs levied on the imports from Japan by 35% on average, gradually raising the removal levels over a period of between 3 to 15 years. Inclusion of such a schedule in our simulations should be considered as a necessary feature of the next stage of the study.

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