SHORT RUN IMPACTS OF TRADE LIBERALISATION ON THE REGIONAL ECONOMY IN INDONESIA

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ABSTRACT: This paper examines the impact of trade liberalisation on regional and national economies in Indonesian using the computable general equilibrium (CGE) modelling approach. The study found that the liberalisation of Indonesian trade has a positive impact on both regional and national economies. The trade liberalisation improves the performance of regional economies differently in the short run. Tariff reforms would result in an increase in welfare as indicated by the increased real household consumption at both regional and national levels. The liberalisation of trade provides an overall expansion of foreign exports even though it results in significant increases in foreign imports, deterioration in the terms of trade and the worsening of inter-regional trade.

1. INTRODUCTION

After an era that was characterised by high and variable effective rates of protection for importable goods and low rates for exportable goods and services, Indonesian trade regimes moved towards a more open economy in the mid 1980s. The Indonesian trade reforms were first introduced in March 1985 when the Government of Indonesia (GOI) rationalised the tariff system through a reduction in the maximum *ad valorem* rate from 225 per cent to 60 per cent and a reduction in a number of tariff lines (Booth, 1992). This liberalisation was initiated to deal with a sharp decline in the world oil prices and to promote non-oil exports. A major step to reform the trade regime was taken on 1st April 1985 when the GOI announced a set of decrees dealing with the administration of imports and exports. These Presidential decrees were aimed at promoting the growth of non-oil exports by removing various bottlenecks that inhibited exports and by abolishing practices that contributed to a "high cost" economy. For this, the functions of the Indonesian Customs Service were transferred to a private Swiss firm called Société Générale de Surveillance (SGS). James (2001), Djidin (1997) and Dick (1985) claim that this transfer of customs functions was a most revolutionary and controversial measure, which has been copied from Nigeria. The 1985 reforms have also been regarded as a turning point in the Indonesian strategy to change from an import substitution industrialisation (ISI) policy to an export-oriented growth strategy. Since then, the GOI has advanced its

commitment to further deregulate its trade by the announcement of follow-up trade policy reforms at roughly annual intervals.

A vast array of studies has been undertaken in recent years to address a wide range of policy issues in Indonesia, including trade reforms. However, little attention has been paid to the role played by such policy changes in regional development or to the response of regional economies to policy changes at national level. Most studies focus on the impact of policy issues at the national level. In fact, changes in policy may have different impacts on regional economies as each region experiences different sources of growth. This paper focuses on the regional issue by assessing the impact of trade liberalisation on the regional (sub-national) economy of Indonesia by applying an interregional computable general equilibrium (CGE) approach.

Section 2 reviews the regional economic performance in Indonesia. It is followed by in Section 3 a brief outline of the interregional CGE model of Indonesia. Section 4 presents simulation results and discussions. Finally, Section 5 concludes the paper.

2. GROWTH AND STRUCTURAL TRANSFORMATION OF THE REGIONAL ECONOMY IN INDONESIA

For over three decades, the Indonesian economy has undergone various experiences due to different economic development plans, strategies, policies and rates of economic growth. The government adopted and implemented various policies shifting the emphasis from more inward-oriented and protective policies to more outward-oriented and open policies. The results achieved from these economic strategies and policies have varied but in general have been quite remarkable particularly after the economy became more open to the rest of the world. Before 1965, Indonesia was a "basket case" with high inflation approaching 1000 per cent (Hill 1996) but in the subsequent 35 years its economy experienced rapid growth and structural change until the most recent economic crisis that has affected the Indonesian economy since the mid 1997.

In analysing Indonesia's overall economic performance, some notable economic achievements can be identified at the regional level. Over the past three decades, every region in Indonesia has to some extent experienced economic growth. The Gross Regional Domestic Product (GRDP) expanded by over 5 per cent per annum on average. As can be seen from Table 1, the Sumatera region seems on average to show the lowest GRDP growth. On average, the highest growth occurred in the regions of Sulawesi and Java even higher than the national rate of growth, except during the economic crisis. Hill (1992, 1996, 1997, 1998) noted that the pattern of economic growth has been reasonably even across the country due to the success of the government in distributing the proceeds of the oil windfall and its implementation of macroeconomic policy. With the assistance of the oil windfall and foreign aid, the Indonesian government has invested heavily in transport facilities, communications and other physical infrastructure that have acted in such a way as to reduce regional barriers to commerce.

Table 1. Average Growth Rate of Gross Regional Domestic Product (in percentages).

Region	1975-1983[a]	1983-1988[b]	1988-1993[b]	1993-1996[c]	1996/1997[d]	1997/1998[d]	1998/1999[d]
Sumatera	4.81	6.58	5.94	5.49	3.87	-7.51	1.86
Java	9.15	9.91	7.61	7.40	4.74	-16.20	1.13
Kalimantan	10.76	7.82	5.86	5.60	2.67	-2.97	3.07
Sulawesi	8.57	7.76	8.11	6.30	4.80	-4.56	3.42
Rest of Indonesia	6.64	7.90	8.03	4.97	2.89	1.08	-3.60
Total Indonesia	7.92	7.67	7.04	6.55	4.70	-12.99	0.68

Source: Bappenas (1999) and BPS (various issues, b).

Notes: a) based on 1975 price (Bappenas 1999); b) based on 1983 price (Bappenas 1999); c. based on 1993 price (Bappenas 1999); d. based on 1993 price and data for 1999 is a preliminary figure and the author's estimation.

Along with rapid national and regional economic growth, there have been changes in the regional economic structure. Outside Java, the agricultural sector provides a dominant share of GRDP even though its role has declined over the years. Its contribution fell from 51 percent in 1971 to 38 percent in 1999. The most significant change in the economic structure took place in Java where the share of the agricultural sector dropped from over 40 percent in 1971 to less than 18 percent of GRDP in 1999. In addition, the share of the manufacturing sector has changed in every region. The share of the manufacturing sector in GRDP has approximately doubled between 1971 and 1999. Among the regions, Java and Kalimantan have the highest contribution of their GRDP accounted for by the manufacturing sector, namely around 35 percent. The percentage contribution of the manufacturing sector throughout the years has remained more or less steady in all regions, ranging from 30 to 50 percent annually.

Even though the share of the agricultural sector in GRDP has decreased significantly, its contribution to employment is still considerable. From 1982 to 2000, this sector employed well over 50 percent of the total labour force in most regions except Java. In contrast, the manufacturing sector, which partially replaced the agricultural sector in GRDP in Java, employed only about 17 percent of the total workers in 2000. This sector contributed approximately 8 percent to employment in the other four regions.

Despite the economic growth experienced in all regions, a large interregional economic variation exists in a number of areas. Firstly, in terms of its contribution of GRDP to GDP, Java dominated the Indonesian economy. Java contributed well over 50 per cent of total GDP which is 10 times more than that of Sulawesi and Rest of Indonesia (ROI). If oil and gas are excluded from GDP and GRDP, the contribution of Java from non-oil GDP is still the highest (63 per

cent) whereas all other regions combined contributed a little more than one third.

Secondly, when the size of the regional population is taken into account, there exist large disparities in per capita GRDP (Kawagoe, 1997 and Hill, 1996). For example, between 1987 and 2000, the average per capita GRDP for the natural resources abundant region, Kalimantan, was four times the per capita GRDP of Sulawesi and twice the per capita GRDP of Java. Sumatera recorded the second largest per capita GRDP during the same period. These disparities become greater if they are calculated at the provincial level. The per capita GRDP in East Kalimantan for instance was more than 16 times that of West Nusa Tenggara. Furthermore, these disparities remain very significant even after oil and gas revenues have been excluded.

Thirdly, it is also clear that Java is dominant in terms of its share in GDP. Throughout all years, the contributions of all sectors in Java have been the highest among the regions except in the era of oil boom (1974 – 1981). For instance, even though the role of the agricultural sector was on the decline, the Javanese share was more than 10 percent of national GDP in 1999. For Sumatera, it was similar while in other regions the share was around 3 percent. In addition, the fact that industrialisation in Indonesia is largely concentrated in Java becomes clear from the share of the manufacturing sector of Java in GDP. Java's manufacturing sector's share in GDP was 14.4 percent in 1986 which increased to 23.8 percent in 1997 before decreasing slightly to 20.9 percent in 1999 due to the economic crisis. These shares are approximately four times those for Sumatera, seven times those for Kalimantan, and more than 12 times those for Sulawesi and ROI. Again, this shows the large disparity that exists among regions in Indonesia.

3. AN OVERVIEW OF THE MODEL

The need for assessing the regional impact of economic policy has increasingly become a concern to policy makers. This is due to the empirical findings that have indicated that regions respond differently to changes in policies and to exogenous shocks that may significantly diverge from the national average (Nijkamp et al. 1986). Regional differences in economic structures and the influence of infrastructure may cause regions to react differently to any policy change. In studying the varying impact on regions, many empirical models for the analysis of regional policy have been developed and applied. These include static input-output models, models using Social Accounting Matrices (SAM), and macro-econometric models. The state of the art displayed by such models has been reviewed in numerous publications (see Nijkamp et al. (1986), Batley and Madden (1986), Harrigan and McGregor (1988) and Bodkin et al. (1991)).

A recent development in regional economic modelling has been the application of the CGE approach. Regional or interregional CGE models are generally derived from national models (Partridge and Rickman 1998). The most typical characteristics of CGE models, which make them different from other regional models, are the endogenous determination of relative prices, acceptability of imperfect input substitution, and unrestrictiveness upon a non-

linear production function (Wuryanto 1996). A wide range of regional CGE applications has been surveyed and reviewed by Partridge and Rickman (1998).

In Indonesia, the application of regional CGE models has been fairly limited in comparison to those undertaken at the national level. As in other countries, the paucity of regional data is likely to have restricted such applications. The work of Temenggung (1995) followed by that of Wuryanto (1996) are the earliest attempts to apply the CGE approach at the regional level in Indonesia. However, both studies displayed similarities in following Thorbecke's model with a typical Scarf's algorithm solution and in applying a bottom up approach to regional modelling. Their models also use similar expressions for production and consumption, apply a simple assumption for market behaviour, and involve similar macroeconomic closures. However, they also showed dissimilarities both in the data used and in terms of policies being analysed.

There are two other models that were undertaken to analyse the economy-wide impacts of policy at a regional level. They are Wayang and Indorani. Wayang (Wittwer 1999) and Indorani (PAUE 1999) were adapted from the ORANI-G model of the Australian economy. A major difference between the two previous interregional CGE models and Wayang and Indorani derives from the latter two models designs which use a top down to regional level. Despite the unique features of both Wayang and Indorani, it is difficult to find a study that actually uses these models for analysing policy impacts at the regional level. Both models were applied at the national level in their policy analysis.

In view of the models and their applications discussed above, there is scope for advancing the application of RCGE to Indonesia, that is, by combining a bottom-up approach and applying the Johansen modelling approach. For this reason, a multiregional and multisectoral CGE model for the Indonesian economy, hereafter called MRS-INDO, is developed by following closely the Monash-MRF: A Multiregional and Multisectoral Model of the Australian economy formulated by Peter et al. (1996). Monash-MRF falls into the Johansen type general equilibrium models for which the solutions are obtained by solving the linearized equations of the models.

3.1 The Structure of the Model

MRS-INDO divides the Indonesian economy into 5 sub-nations (regions), namely, Java, Sumatera, Kalimantan, Sulawesi and Rest of Indonesia (ROI). ROI includes Bali and Nusa Tenggara, Maluku and Irian Jaya. In each region, the model identifies 15 industries (sectors), where each industry is assumed to produce a single commodity and creates a single type of capital good. MRS-INDO identifies five groups of economic agents: producers, investors, households, foreigners and regional governments.

MRS-INDO contains five different blocks of equations: (a) CGE core module, (b) the government finance module, (c) the capital accumulation and investment module, (d) the foreign debt accumulations module, and (e) the labour market and regional migration module. These blocks of equations are outlined briefly as follows.

CGE Core Module

The equations in this module are defined following the same structure of the ORANI model of the Australian economy (Dixon, et al., 1997). The CGE core module is presented in three main blocks of equations determining demand and supply relations and market clearing conditions. Also, various regional and national aggregates are defined in this module.

Sectoral Production and Demand for Inputs

Inputs into production are composed of intermediate inputs (domestic and imported), two primary inputs (capital and labour) and other cost items. Labour is divided into four types of occupations: unpaid agricultural workers, paid agricultural workers, unskilled workers and skilled workers. The optimising behaviour underpinning the structure of production technology in MRS-INDO follows the nested production functions which are generic to many CGE models.

The production structure consists of two main branches (intermediate inputs and primary factors) and three levels of production structures. At the highest level, firms combine composite intermediate inputs, composite primary factors, and other costs according to a Leontief production technology so that the demand for the composite inputs is proportional to output. The second level involves substitution between domestically produced and imported intermediate inputs, on one side, and the substitution between labour and capital, on the other side. Composite intermediate inputs are formed subject to a Constant Elasticity of Substitution (CES) function, and with the Armington assumption (Armington 1969, 1970). Similarly, primary input bundles are subject to a CES production function.

At the lowest level, the bundles of domestically produced intermediate input are formed as combination of inputs from different regions and subject to the Armington assumption. Meanwhile, demand for labour is derived from four different occupations subject to a CES production technology.

Demands for Investment Goods

Capital creators for each regional sector combine inputs to form units of capital where they choose inputs to minimise the costs of capital creation. Capital goods are assumed to be produced with inputs of domestically produced and imported commodities. It is also assumed that primary factors are not used directly as inputs in capital formation. The input-demand functions to create fixed capital are assumed to follow a nesting structure similar to a nesting pattern of intermediate input demands, except there is no primary input branch to capital formation.

Household Demands

The household demand structure follows a nested CES/linear expenditure systems preference function. In this household consumption nest, each regional household determines the optimal composition of its consumption bundle based on a nested CES and Stone-Geary utility function. A Keynesian consumption function determines the regional household expenditure as a function of household disposable income. At the bottom level of the nest, a CES utility function is used to allow a substitution across different domestic sources of supply. A similar functional form is also applied for the subsequent upper level of household demand structure, that is, demand for domestic composite and imported goods. Then, at the highest level, the household determines its consumption based on a Stone-Geary utility function leading to a Linear Expenditure System (LES).

Foreign Export Demand and Regional Government

In modelling the export demand, export commodities are divided into two categories: *traditional exports* (food crops, estate crops, livestock, forestry, fisheries, and mining), which comprise the bulk of exports and the remaining, *non-traditional*, exports. The traditional-export commodities demand equation is specified to be a downward sloping foreign-export schedule while the composition of aggregate non-traditional exports is exogenised by treating non-traditional exports as a Leontief aggregates.

In modelling the government demand for current consumption, according to Naqvi and Peter (1996), there is no explicit theory in determining government consumption expenditure. They stated three ways usually used for determining government expenditure for current consumption: (i) endogenously, by the rule as government expenditures moves with household consumption expenditure or domestic absorption; (ii) endogenously, as a policy instrument which varies in order to accommodate an exogenously determined policy target such as a required level of foreign debt; and (iii) exogenously. For this study, the regional government expenditures (a combination of government consumption and change in stocks) are set endogenously as a constant proportion of regional private consumption.

Other equations defined in the CGE core module include tax rates, tax revenue, price system, market clearing, regional incomes and expenditure, price indices, and employment aggregates.

Government Finance Module

The government finance block of equations encompass the equations determining the budget deficit (surplus) of regional governments, the aggregate regional household consumption, and the gross regional products for each region. In this block of equations, the government finance module is presented in five

groups, namely, value-added disaggaregation; gross regional products; household income; miscellaneous equations; and summary of financial transactions.

Capital Accumulation and Investment

This module defines the relationships between capital stock and investment. In MRS-INDO, the relationships between capital and investment are derived for a comparative-static purpose. Therefore, when the model is simulated in the comparative static mode, there is no fixed relationship between capital and investment.

Accumulation of National Foreign Debt

In this block, the national foreign debt accumulation is defined. The specification of the nation's foreign debt is drawn from Horridge et al. (1993) in ORANI-F. The detailed derivation of the nation's foreign debt equation is also outlined in Peter et al. (1996) where the national foreign debt is linearly related to the accumulated balance of trade deficit. This also means that the trade deficits are financed by increases in external debts.

Regional Population and Regional Labour Market Settings

This block of equations computes regional population, which is defined through the interaction of demographic variables. Included in this block are various regional labour market relationships. Two general methods are designed to allow flexibility. That is: (i) the regional population is determined exogeneously with at least one variable in the regional labour market endogenously determined, and (ii) all the variables in the regional labour market are exogenously determined while regional migration is set endogenously. Hence, in this latter scenario, regional population is also endogenously determined.

One key equation in the block is to specify the change in the regional population. The accumulation of regional population is defined as a function of previous regional population, net migration from overseas, net migration from other domestic regions, and the region's natural growth in population.

Several other equations define regional unemployment, regional labour supply, and regional working age population. The regional unemployment in the model is finally determined as a function of regional labour supply and the number of persons employed. The regional working age population and the participation rate determine the regional labour supply. We make a simplification by setting the percentage change in regional population of working age to be proportional to the change in the regional population. The change in net regional migration is based on the forecast change in regional migration. The model also contains equations to define regional employment and regional household formation.

Finally, the national aggregates are computed by summing the corresponding regional variables for the labour markets. These equations include national natural population change, national labour supply, national employment, and the national unemployment rate.

4. DATABASE

The model's database is primarily based on the Multiregional Input–Output Table of Indonesia for 1990 estimated and constructed by Regional Economic Analysis for Regional Investment Planning Project, National Development Planning Agency (Bappenas = Badan Perencana Pembangunan National). This multiregional input-output table consists of 25 economic sectors over 27 provinces including East Timor and was constructed only in producer prices. For the purpose of this study, this multiregional input output table is aggregated into 15 industries over five regions and updated to 1995. Other additional data used are income elasticities of consumption by economic sector of origin provided by Bappenas (1994) and regional financial statistics provided by BPS (various issues). The behavioural parameters employed in this study, such as the Armington elasticities of substitution, are assumed to follow that of in Indorani (PAUE 1999) and Wayang (Wittwer 1999).

5. SIMULATION RESULTS

5.1 Policy Scenario

In this study, experiments on liberalising Indonesian trade refer to the effects of tariff reduction on the regional economy as well as on the national economy. The analysis does not consider non-tariff barriers. To represent trade liberalisation in Indonesia, two scenarios of tariff reduction are proposed, that is, a 25 per cent tariff reduction on the manufacturing sectors and an across the board tariff cut. Both policy scenarios are evaluated in the short run in the comparative–static framework. In these short run simulations, it is assumed that capital is immobile both at inter-industry and inter-regional levels. The short run closure also includes fixed regional population and labour supply, fixed regional wage differentials and fixed national real wages. In addition to these assumptions, investment plays only a demand-side role. It is assumed not to augment the capital stock available for use in the short run. It is assumed that the technical change does not occur during trade liberalisation and hence technology variables are exogenous. Finally, the income tax rate is also exogenous allowing the model's Keynesian consumption function to determine aggregate consumption. Therefore, trade balance is determined as the residual in the GDP identity.

5.2 Short run Impacts of the Trade Liberalisation in Manufacturing Sectors

The numerical results referring to the macroeconomic impacts of the first policy simulation are reported in Table 2. From this table, it is seen that liberalisation improves economic performance, even when only the

manufacturing sectors are liberalised. At the regional level, all regions benefit from the trade liberalisation as indicated by increases in real gross regional product (GRP). As shown in Table 2, the real GRP increases differently in specific regions ranging from 0.21 percent (Kalimantan) to 0.36 percent (Sumatera and Java). At the national level, the real GDP rises by 0.33 percent. These gains can be explained as follows.

From the supply side, the increase in real GRP (and GDP) could be attributed to improved efficiency in resource allocation. This improved allocational efficiency is largely reflected in the increased level of employment rather than the increased capital usage. As presented in Table 2, trade liberalisation in the manufacturing sectors resulted in an increase in demand for labour across sectors and regions. At the regional level, total employment increases between 0.42 per cent (Java) and 0.59 per cent (Sulawesi). From Table 2, it is also clear that the increase in total employment in every region is attributed to rapid expansion of employment of unskilled and skilled workers that are predominantly employed in the manufacturing sectors. Regional differences in the percentage change in total employment are likely to result from differences in changes in activity level and employment by occupation.

The reasons as to why the level of employment in the short run is stimulated more by the changes in unemployment rates rather than by changes in real wages is explained by the simulation results. The unemployment rates decrease both regionally and nationally. At both levels, it declines almost at similar rates with similar changes in total employment. Regionally, the unemployment rate decreases approximately 0.50 percent, while at national level it falls by about 0.45 percent.

The increase in real GRP (and GDP) is less likely to be initiated by the use of more capital. While the capital is fixed in the short run, the simulation results show that the liberalisation of the manufacturing sectors leads to a higher price of capital. From Table 2, regional capital prices increase ranging from 0.24 percent to 0.41 percent while nationally the price increase is 0.33 percent.

From the demand side, the source of real GRP growth in each region varies (see Table 2). In Sumatera, for instance, the real GRP has increased because of increases in real household consumption, real government consumption and an improved balance of foreign trade. The real private and public consumption growth in Java is higher than in Sumatera but the real GRP in Java rises slightly less than in Sumatera. This is mainly because total domestic and foreign trade balances in Sumatera have lower deficits than in Java. For other regions, differences in real GDP growth are caused by dissimilarities in real household and real government consumption rather than changes in the balance of trade. Trade liberalisation in the manufacturing sectors also expands foreign imports in all regions. This happens because tariff reductions immediately reduce the price of imported goods boosting the foreign import demand. From Table 2, it is seen that all regions experience increases in demand for foreign imports. The changes in import volume vary across regions. For example, Sumatera experiences a more than five per cent increase in imports. It is followed by Java, Kalimantan, Sulawesi and ROI where import volume increases by 3.98 percent, 1.48 percent,

1.45 percent and 0.57 percent respectively. Nationally, foreign imports expand by more than 4 percent when the tariff on manufacturing sectors is reduced by 25 percent.

Table 2. Short Run Effect of a 25% Manufacturing Sector's Tariff Reduction on Selected Regional and National Variables (% change)

Variable	Regional Gain or Loss					
	Sumatera	**Java**	**Kaliman-tan**	**Sulawesi**	**ROI**	**Nation**
Real GRP and GDP	0.3638	0.3606	0.2107	0.3533	0.2793	0.3308
Real Household Consumption	0.7425	0.8144	0.4354	0.4549	0.4127	0.7248
Real Government Consumption	0.7425	0.8144	0.4354	0.4549	0.4127	0.6598
Interregional Export	-0.8363	1.7926	-2.9215	-1.0185	-1.3874	-
Interregional Import	2.1316	-1.4616	0.9590	2.1704	1.4611	-
Interregional BOT	-0.1394	0.3141	-0.0789	-0.0365	-0.0593	-
Foreign Export Volume	2.1395	3.5093	0.7334	2.0645	2.0300	2.1074
Foreign Import Volume	5.2256	3.9799	1.4754	1.4495	0.5699	4.0224
Foreign BOT	0.0827	-0.6867	0.1065	0.0435	0.0696	-0.3852
Total BOT (ordinary change)	-0.0567	-0.3726	0.0276	0.0070	0.0103	-0.3852
CPI	-0.7130	-0.8926	-0.3765	-0.3533	-0.3308	-0.7537
Domestic TOT	0.4926	-0.4760	0.5423	0.2924	0.2736	
Foreign TOT	-0.2127	-0.3456	-0.0732	-0.2068	-0.2232	-0.2107
Employment (total)	0.5150	0.4214	0.5256	0.5945	0.5630	0.4669
Employment by Occupation						
(a) Paid Agricultural	0.1478	0.0221	0.5282	0.4264	0.3825	0.2048
(b) Unpaid Agricultural	0.1332	0.0309	0.4511	0.3643	0.2914	0.1573
(c) Unskilled	0.5478	0.7128	0.4931	0.6056	0.5541	0.6305
(d) Skilled	0.7178	0.4263	0.5665	0.7733	0.7407	0.5400
Unemployment Rate	-0.5009	-0.4071	-0.5112	-0.5694	-0.5516	-0.4521
Capital Rentals	0.2403	0.4117	0.2442	0.4122	0.3196	0.3290

Source: Simulation Results

Note: These computations are presented in the percentage changes with the exception of balance of trade (domestic/interregional, foreign and total) which are given as ordinary changes, i.e., multiplying by a factor of 100 to convert a percentage change form into a proportional change. Therefore, BOT has the units "trillions of Rupiah".

The effects of tariff reductions on foreign exports show that all regions gain by expanding their export volumes. At the regional level, foreign export volumes from Java increase by more than 3.51 percent, the highest among the regions. The regions of Sumatera, Sulawesi, ROI and Kalimantan follow this. Increase in export volumes are mainly due to the reduced costs of production. Also, prices of imported goods, including imported intermediate inputs, fall. These intermediate inputs play a significant role in economic activities, particularly in the manufacturing sectors. Thus, the reduction in the intermediate input prices decreases production costs and induces output expansions. As discussed earlier, manufacturing sectors in Indonesia are concentrated in Java. Therefore Java is the main gainer from manufacturing sector liberalisation in term of exports. As the nominal exchange rate is fixed in the simulations, the decline in the consumer price (CPI) index implies a real depreciation. This further explains the expansion of foreign exports.

It turns out that the expansion of foreign imports in some regions is higher than the expansion in foreign exports. This does not always produce a deficit in the balance of trade in the short run. The foreign trade balance resulting from the first policy scenario largely relies on trade conditions in the benchmark year.

The liberalisation of the manufacturing sectors generates mixed results in interregional trade. With the exception of Java, the remaining regions experience a decrease in exports. Their interregional (domestic) exports fall at an average rate of 1.54 percent while Java experiences around a 1.79 percent increase. Conversely, only Java experiences 1.46 percent decrease in domestic imports, whereas as other four regions experience a rise in their imports at an average rate of 1.68 percent. A possible reason for this result is that it is more profitable to trade with foreign purchasers than domestic purchasers despite differences in location and distances. The increase in foreign exports and imports resulting from the tariff reduction supports this. Another possible explanation is that increased foreign imports have penetrated the domestic market, this in turn lowering the volume of domestic commodities traded. A clear result of this is a decrease in interregional trade flows.

Java is the main exporter and the main market for domestic commodities accounting for more than 50 percent of domestic goods flow from and to this region. Clearly, the effects of the manufacturing sector liberalisation are not severe enough to change the pattern of domestic trade in Java significantly in the short run.

5.2 The Impact of an across the Board 25 percent Tariff Reduction

Table 3 reports the results of the across the board 25 percent tariff cut. From this table, it is clear that trade liberalisation generates an increase in real GRP and GDP. At the national level, real GDP increases by a 0.34 percent. This expansion if viewed from the expenditure side is attributable to the increased real private and public consumption as well as foreign exports. These variables change by 0.76 percent, 0.69 percent and 2.13 percent respectively. The expansion in employment is the main factor that affects the growth in real GDP when considered from the income side. Regionally, three regions benefit more

from an across the board tariff cut than the other two. These are Sumatera, Java and Sulawesi where real GRP grow more than 0.36 percent. In Sumatera and Java, growth in real GRP is from increases in real private and public consumption as well as the changes in the balance of trade. In Sulawesi, the expansion of consumption and positive gains in the balance of trade contribute to its growth in real GRP.

Table 3. Short Run Effect of a 25% Tariff Reduction across the Board on Selected Regional and National Variables (% change)

Variable	Regional Gain or Loss					
	Sumatera	**Java**	**Kaliman-tan**	**Sulawesi**	**ROI**	**Nation**
Real GRP and GDP	0.3828	0.3681	0.2175	0.3644	0.2898	0.3412
Real Household Consumption	0.7946	0.8451	0.4631	0.4880	0.4508	0.7592
Real Government Consumption	0.7946	0.8451	0.4631	0.4880	0.4508	0.6939
Interregional Export	-0.8361	1.8285	-2.8932	-1.046	-1.398	-
Interregional Import	2.1885	-1.4615	0.9799	2.2069	1.4770	-
Interregional BOT	-0.1408	0.3169	-0.0788	-0.0373	-0.0600	-
Foreign Export Volume	2.1773	3.5198	0.7363	2.0959	2.0728	2.1274
Foreign Import Volume	5.3729	4.0520	1.6637	1.8928	1.0167	4.1189
Foreign BOT	0.0809	-0.7076	0.1052	0.0422	0.0685	-0.4116
Total BOT (ordinary change)	-0.0598	-0.3907	0.0264	0.0048	0.0085	-0.4116
CPI	-0.7236	-0.9109	-0.3871	-0.3700	-0.3527	-0.7702
Domestic TOT	0.4961	-0.4795	0.5493	0.2933	0.2691	-
Foreign TOT	-0.2163	-0.3466	-0.0735	-0.2097	-0.2250	-0.2125
Employment (total)	0.5576	0.4352	0.5430	0.6122	0.5806	0.4871
Employment by Occupation						
(a) Paid Agricultural	0.1691	0.0043	0.5526	0.4276	0.3777	0.2047
(b) Unpaid Agricultural	0.1360	-0.0041	0.4616	0.3546	0.2572	0.1374
(c) Unskilled	0.6104	0.7442	0.5102	0.6348	0.5856	0.6650
(d) Skilled	0.7686	0.4491	0.5850	0.8063	0.7769	0.5686
Unemployment Rate	-0.5424	-0.4204	-0.5281	-0.5863	-0.5689	-0.4716
Capital Rentals	0.3048	0.4437	0.2669	0.4436	0.3598	0.3675

Source: Simulation Results

Note: These computations are presented in the percentage changes with the exception of balance of trade (domestic/interregional, foreign and total) which is given as ordinary changes, i.e., multiplying by a factor of 100 to convert a percentage change form into a proportional change. Therefore, BOT has the units “trillions of Rupiah”.

The across the board 25 percent tariff reduction increases regional as well as the national level of employment more than what was experienced under the first policy scenario. At the regional level, the average rate of employment growth is 0.56 percent and 0.44 percent respectively for the region of Sumatera and Java

while other regions experiencing a 0.54 percent (Kalimantan), 0.61 percent (Sulawesi) and 0.58 percent (ROI) employment effect. At the national level, the uniform tariff cut positively affects the total employment by industry with an average growth of 0.48 percent.

As usual, trade liberalisation stimulates trade both in imports and exports, especially in foreign trade. Table 3 shows that foreign imports and exports increase across regions as a result of the short run foreign trade effects of a uniform tariff reduction. All regions experience an increase in foreign imports with Sumatera having the highest expansion followed by Java. Again, the expansion of foreign imports occurs because tariff reductions cause a decline in import prices, which lead to increased consumption of imported commodities from overseas.

In addition, all regions experience beneficial effects in foreign exports resulting from the across the board tariff reduction. Again, Java benefits most from the trade liberalisation, as indicated by the highest expansion in foreign exports (3.5 percent), whereas Kalimatan experiences the lowest (0.7 percent). Other three regions have 2 percent growth in exports. Similar to the first scenario, foreign export expansion is attributed to a fall in the CPI which leads to a real depreciation. However, it should be noted that the role of the elasticity of demand for foreign exports is crucial in determining the degree of impact on foreign exports when trade policy changes towards liberalisation (Dervis, Melo & Robinson 1982).

The rapid expansion of foreign imports apparently only intensifies a problem in the balance of foreign trade in Java, as shown in Table 3. Other regions experience increases in foreign trade balances ranging between 0.04 percent (Sulawesi) to 0.11 percent (Kalimantan) even though their foreign import growth exceeds their foreign export growth. This may be caused by the changes in terms of trade in the short run. However, it should be noted that the status of the foreign trade balance in the base year could also produce this result.

Furthermore, the 25 percent across the board tariff reduction creates a total balance of trade problem in Sumatera when the interregional and foreign balances of trade are combined. This is primarily caused by the deficit in domestic trade resulting from rapid expansion of domestic imports together with decreases in domestic exports. In this region, the domestic balance of trade in the benchmark year is in surplus. In other regions, however, rapid expansion of domestic imports and rapid contraction of domestic exports is not enough to change the level of total trade balance in the short run (see Table 3).

The growth in interregional and foreign imports in all regions but Java leads to welfare gains represented by increased real private consumption. From Table 3, all regions experience an increase in real household consumption ranging from 0.45 (ROI) to 0.84 (Java). However, as mentioned earlier, expansion in imports could worsen the balance of trade.

Another source of welfare gains could be the improvement in allocative efficiency experienced when resources are reallocated into areas of more efficient production. Since capital is fixed in the short run, employment is the only variable resource. This argument could be examined through the effects of

the uniform tariff cut on employment. Agricultural labour in Sumatera and Java is likely to shift to more efficient sectors such as the manufacturing and services. The reductions in unemployment also indicate increase in allocative efficiency.

5.3 Comparison of some Key Economic Indicators

This section compares some key economic indicators affected by trade liberalisation. The comparison is aimed at evaluating how far regions respond to trade policy changes and at assessing the degree of impacts resulting from the two different policy scenarios. These key indicators include real GRP (or GDP) and trade flows.

As discussed earlier, trade liberalisation has a positive impact on economic growth as indicated by gains in real GRP and GDP. All regions benefit from trade liberalisation in all policy scenarios. At the national level, real GDP increases with trade liberalisation. It is also clear that the second policy scenario generates a higher real income growth. This suggests that there is a relationship between degree of openness and economic growth. More open liberalised Indonesian trade is likely to have more beneficial effects. These results are consistent with the previous findings (Drabek and Laird 2001; Fukushima 1979; Vousden 1990).

In comparing the real GRP (and GDP) results from Tables 2 and 3, Sumatera emerges as the main winner from trade liberalisation. In all policy scenarios, real GRP in Sumatera increases above the national and other regional levels. This is followed by Java. Even though Java dominates the Indonesian economy, it gains fewer benefits in terms of real GRP growth. Firstly, these results may be caused by the difficulty of shifting resources from less value added agriculture (especially in the food crop sector) to high value added agricultural sectors such as the estate sector or livestock. This is indicated by the decline in outputs particularly from the agricultural sector in Java. In general, the agricultural sectors in Java expand as a result of the tariff cut but their expansion is not as high as in the other four regions.

Another reason for those results is that other regions benefit from increases in employment. As discussed earlier, trade liberalisation resulted in an increase in employment generally. The increase in employment in Sumatera, Kalimantan, Sulawesi and ROI is higher than in Java. In addition, the structure of the regional economy may lead to this difference in results. The Javanese economy relies heavily on the manufacturing and service sectors. For the other regions, the primary sectors are reasonably comparable to the manufacturing and service sectors in the GDP composition. Certainly, tariff reduction gives more benefits to the sectors that use more intermediate foreign inputs, such as the manufacturing sectors, which are concentrated in Java. However, because output growth in the primary sectors in Java is the lowest and is nearly half of the growth in Sumatera and Sulawesi, the average sectoral output effect for Java becomes smaller than for Sumatera. This in turn affects real GRP.

As usually expected, all regions benefit from trade liberalisation in terms of expansion of foreign exports. The results from the two policy scenarios show expansion of foreign exports in all regions and nationally. Most of this

expansion is attributable to the real depreciation of the currency caused by a decrease in the CPI. The CPI declines significantly when the tariff is cut. These real depreciations in turn boost foreign exports. Another key factor is the surplus of domestic commodities as sectoral outputs expand. The results from all policy scenarios show that trade liberalisation also brings about increases in sectoral outputs. An increase in sectoral outputs implies an increase in domestic supply which leads to the export expansion. Many studies find that trade policy reform boost economic performance and that strong and positive relationships exist between growth in exports and outputs (see Thomas et al. 1991, for instance).

The question of why Java experiences the highest growth in foreign exports can be explained further. Once trade is liberalised, relative prices and the level of production change owing to increases in intermediate input usage. The results show that expansion of output in Java is the highest on average mainly due to output growth in the manufacturing sectors, which use more foreign intermediate inputs. As a result, the availability of commodities for exports also increases. Also, a relatively higher contraction of CPI in this region indicates a higher real depreciation effect in Java, boosting foreign exports from this region.

This study also reveals that trade liberalisation has a positive impact on foreign imports across the regions and nationally. This finding is not unexpected since a direct impact of tariff reductions is a fall in prices of foreign goods which leads to increase in imports. Among the policy scenarios, the across the board tariff cut has the highest impact on foreign imports implying that broader tariff reductions have more beneficial effects than "piecemeal" tariff cuts (Fukushima 1979 and Vousden 1990). In addition, among the regions, Sumatera has the highest growth in foreign imports. One key factor in explaining this result is increase in employment. The simulation results show that Sumatera experiences the highest upsurge in employment. Another factor is an increase in demand for foreign intermediate inputs to expand outputs. In contrast, foreign imports in Java remain high and relatively higher than for the other three regions. This is due to the rapid expansion of outputs especially in the manufacturing sectors that require more foreign intermediate inputs.

Above all, the role of the elasticity of substitution between domestic and foreign commodities (the Armington elasticities) is significant in determining to what degree the demand for foreign imports and domestic goods will change. The significance of the elasticity of substitution is clear when it is used in sensitivity analysis by changing the value of the Armington elasticity. In addition, the elasticity of demand for exports is also important in determining the degree of export expansion.

6. CONCLUSION

The broad picture that emerges from the forgoing analysis is that the liberalisation of Indonesian trade has positive impacts on regions to a varying degree. The study finds that trade liberalisation improves the performance of regional and national economies in the short run. Across the regions, different tariff reforms have different impacts on real GRP while Sumatera and Java are shown to gain the most from trade liberalisation.

Tariff reforms would also result in an increased welfare as indicated by the positive effect on real household consumption at both regional and national levels. The improvement in welfare is primarily accounted for by falls in foreign commodity prices leading to increased foreign imports. Another potential effect of tariff reforms on macroeconomic indicators is that all regions benefit in terms of increased foreign exports.

The results of this study support the view that Indonesia should pursue initiatives such as AFTA, APEC and WTO that could lead to further trade liberalisation. However, the Indonesian government should give priority to Eastern Indonesia in order to attract more investment to these less developed regions. Direct government intervention for regional development is necessary. The central government could provide investment incentives and increaseed facilities, such as transportation infrastructure, in order to exploit opportunities offered by trade reforms. Even though the central government has given more political and economic power to the regional governments recently, the central government could also encourage regional governments to create regional alliances for the region-wide development and employment strategies in order to share resources and to plan key transportation and infrastructure investments. However, the most important policy is that regional governments should strongly promote and facilitate investment on their own. This would mean that the region could take advantage of the opportunities for investments at global, interregional and national levels.

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