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IMPACTS OF ECONOMIC REFORM ON RURAL-URBAN WELFARE: A GENERAL EQUILIBRIUM FRAMEWORK

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This paper demonstrates how economic reform undertaken in a developing country will impact not only macroeconomic variables but also income distribution between different household groups, particularly between rural and urban households. Unlike the well-known link to macroeconomic variables, the path connecting economic reform with income of rural-urban households is more equivocal and thus demands an inquisition. The CGE model constructed in this study is designed to serve such a purpose. When applied to the Indonesian case, both the static and dynamic simulations indicate that the post-reform progress in the country's macroeconomic condition is likely accompanied by worsening—albeit slightly—household income distribution between income groups. The non agricultural sector appears to be the major beneficiary of the reform. From the dynamic simulation, a worsening distribution is also found between rural and urban areas. However, results of both simulations also show that improved poverty conditions are likely achieved following the reform.

1. Introduction

In the last decade, there have been numerous studies conducted on the impact of policy reform in a number of developing countries. Most of the performance indicators used, however, are in the category of macroeconomic variables, e.g., GDP growth, current account balance, inflation rate and exports. While these variables are undoubtedly important, other indicators deserve a further look. In particular, the types and magnitudes of impacts of the policy reform on equity issues are of great interest in many developing countries.

The focus of this paper is to demonstrate how external shocks and policy reform generate impact not only on macroeconomic variables but also on the welfare (income) condition of different households, particularly on the distribution between urban and rural households, using the case of Indonesia. A computable general equilibrium (CGE) model is used as a framework of analysis. A number of adjustments and extension to the standard neo-classical CGE model, however, are necessary, since the working of markets in developing countries does not always conform with the standard CGE specifications. Given the fact that most policies within the program were promulgated in the mid 1980s, the selected benchmark year is 1985.

Section 2 describes the CGE model and the mechanism through which external shocks and policy reform produce impact on household welfare (income) in a typical developing country. Section 3 reports the analysis of impacts of various external and policy shocks on a set of macroeconomic variables and households' welfare conditions under a comparative-

static (one-period shock) simulation. Results of a dynamic (multi-period) simulation are discussed in Section 4.

2. The Model

The basic model in this study follows closely that of Azis (1995). It is basically a CGE model by Adelman and Robinson (1978). With 8 factors, 8 household categories, 3 borrowing agencies and 30 production sectors, there are in total 1,121 equations in the model, the complete list of which is shown in the appendix. To model an open economy with free flows of capital, a separate block of capital flows needs to be built. In addition to its influences on prices of intermediate input and of capital, as well as on tariffs and other revenues, the exchange rate will affect capital accounts in the balance of payments by altering the flows of foreign capital. Hence, foreign capital flows other than official (government) flows are modeled as in Eq. 45. It basically specifies that capital flows will respond to three major factors: interest rate differential, risk premium, and exchange rate expectation. The parameter *degree* denotes the intensity of controls the government puts over capital flows; its value ranges from 0 (totally closed to international capital flows) to 1 (complete capital account liberalization). In this respect, σ_0 could be defined as the autonomous capital flows.[1] The risk premium is to be determined by the debt service ratio (see Eq. 46). The specifications of Eqs. 45 and 46, and their corresponding parameters, are based on the results obtained from an econometric study using the period of 1980-1990.

In a consistent multi-period simulation, foreign capital flows (FCAP) will affect the size of capital stock, change the structure and magnitudes of factor prices, and in turn lead to changes in the whole composition of the labor market. It is through such a process that the household income will be eventually determined.

But FCAP is only one of the sources of capital augmentation; another is domestic investment. In this regard, the model makes a detour from a Walrasian general equilibrium model in that the (private) investment is determined via an equation taken from an independent econometric study (see Eq. 49).[2] From such a specification, an exchange rate adjustment (either crawling depreciation or one-shot devaluation) can bring about two opposing forces in the flows of foreign capital: reducing the flows because of increased exchange rate expectation, and augmenting the flows via increased exports or reduced premium risk. If the latter applies, foreign investment is expected to increase (see Eq. 47).

The basic data of sectoral capital stock and investment by sector of destination are taken from Lewis (1991), and based on Keuning (1988) and Keuning (1991).[3] On the basis

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[1] This specification is close to what is often termed as "stock specification for international capital flows." See Mohsin S. Khan & Roberto Zahler (1989).

[2] See N. Shafik and A. Chhibber (1988). The quoted study estimated only the aggregate investment; further improvement for sectoral investment is shown in E. Thorbecke et. al (1992).

[3] The data were measured in constant 1980 prices. The capital stock is estimated based on a "perpetual inventory model" (PIM) using certain assumptions on sectoral depreciation. With such an approach, sectoral investment and capital stock for 1985 can be derived. However, the data used in the current model are already adjusted; details on the adjustment are discussed in J. Lewis (1993).

of these data, an investment coefficient matrix ($capmat_{j,i}$) indicating the sectoral composition of investment for each investing sector is computed and used in Eqs. 12, 17 and 53. Inventory is expressed as a fixed proportion of total output (Eq. 13). The combined private and government investment, after adjusted for inventory changes, will reflect the change in capital stock. In turn, this change will determine the new (t+1) capital stock (Eq. 54). Needless to say, this equation plays a pivotal role in a dynamic (multi-period) analysis.

The private consumption is derived from a standard utility maximization, in which a Cobb-Douglas function with fixed expenditure shares is adopted (Eq. 10). The government investment is set to be exogenous (as a policy variable) since the policy reform to be analyzed also includes changes in the level as well as sectoral composition of this investment.

A number of studies have indicated that sectoral wage rates in Indonesia are strongly influenced by inflation rate, price of output and growth of labor productivity.[4] The specification of sectoral wages shown in Eq. 55 implies that a labor market segmentation exists with wages being strongly sector-specific. The average labor price is derived on the basis of these sectoral wage rates; it is this price that will eventually alter the labor demand. With such labor demand, and under a certain assumption of labor supply (taking into account rural-urban migration), the open unemployment level can be arrived at.[5] The derived labor demand will in turn determine the factor returns; through a set of coefficients in a social accounting matrix (SAM) these factor returns are translated into household incomes (Eq. 28).

In the output block, a set of nested CES functions is specified for the production technology. The value-added and intermediate inputs appear as RHS variables in the output equation (Eqs. 1 and 2). Such a specification is necessitated by the fact that the economic reform adopted in Indonesia contains some shocks, among others in exchange rate (1986 devaluation) and external variables (a plunge in oil prices in 1986), and through a continued series of tax reform in 1985, such that the input composition and value-added output ratio should be allowed to change.

A departure from a neo-classical setting is also made in the factor demand, among others in the labor market. The factor price for labor demand is determined via an independent equation of wages shown earlier. The prices for other factors, i.e., capital and land, are solved in the system to clear the market.

The domestic and exported goods are assumed convertible but not without costs. A constant elasticity of transformation (CET) function is therefore applied, resulting in an output price as shown in Eq. 14. The sales composition of domestic product, i.e., domestic

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[4] Among the important works in this strand of research is that of the Center for World Food Studies of the University of Amsterdam. See Thorbecke et.al. (1992).

[5] With the assumption of intersectoral factor mobility, factor prices tend to be equalized and they will reflect the average factor prices of the respected factor (the same for all sectors). Obviously, as also found in many countries, this is not the case with the actual (observed) factor prices in Indonesia. Hence, a set of adjustment parameters, i.e., factor price distortion, denoted by FPDIST, can be derived. In a perfect mobility case, the values of these parameters will all equal unity. On labor migration, the supply of labor, treated exogenously, is taken from actual data, which already includes the dynamics of rural-urban migration.

sales and exports, is determined by way of a revenue maximization program. No income effects are taken into account; i.e., the exports to domestic sales ratio is determined entirely by its price ratio. A standard Armington function is applied for the total supply, resulting in Eq. 15. This implies that simultaneous exports and imports, i.e., cross-hauling, are allowed. In effect, such a specification avoids the price equalization tendency, since domestic prices are independent of world prices. Furthermore, similar to the specification of export to domestic sales ratio, income effects are also not allowed in this case.

In the price block, prices are basically expressed through a set of equations corresponding to equilibrium prices. For example, Eq. 15 basically shows the equilibrium of supply (*PQ. Q*) and demand; the latter consists of domestic and import demand (*PD.D* + *PM.M*). A similar notion applies to Eq. 14. The domestic goods' prices variable (PINDOM) is set as a *numeraire*, against which all prices will be measured. In order to arrive at producers' prices, the price of domestic sales is adjusted by the relevant taxes, i.e., value-added tax and other indirect taxes.

The sectoral prices of capital are expressed in terms of weighted sum of the costs of investment goods. However, the Indonesian value-added tax (VAT) is of the tax credit type, whereby firms will apply the specified rate to their domestic sales and then subtract all VAT paid on inputs as credits. Obviously, these credits are received by VAT paying sectors on their intermediate inputs from other VAT sectors. Hence, to arrive at the producers' price of capital, the price of composite supplied goods in the expression has to be deducted by these credits (Eq. 17).[6] Similarly, the expression for price of intermediate inputs contains a subtraction of VAT credits (Eq. 20). There are two components in the VAT credits: the domestic sales and imports. These are precisely the two activities on which the VAT is imposed in the Indonesian system. The domestic price of imports is consequently marked up by this tax (Eq. 18).[7] On the contrary, the domestic price of exports has to be adjusted downward by the export tax (Eq. 19).

In the income block, revenues accrued to all factors and institutions, i.e., labor and household, corporation, land and government, are first specified before arriving at the household income (Eq. 27). The ultimate target variable in the present analysis, the per-capita household income, is then derived in Eq. 30 (a proxy measure of welfare).

In the public finance sector, VAT is an important source of revenues. There are four components in the VAT: The first two are the VAT on domestic sales and imports; the third is basically identical with the definition of VAT credits discussed earlier; and the last is VAT credits for investment goods (Eq. 34).

The household saving is measured on the basis of constant marginal propensity to save (mps) and disposable income (Eq. 31). The corporate saving is determined based on the gross (before tax) income and a constant rate of corporate saving (Eq. 41). All savings combined (including foreign savings) comprise total savings, the magnitude of which, if the model is appropriately set, is equal to total investment ("Walras law" - see Eq. 60 and corresponding notes).

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[6] See Lewis (1991).

[7] In the model, world export and import prices are set exogenously. They are examples of variables to be altered under different experiments of changing external shock situation.

The above specification of saving and investment implies that the resulting model basically adopts an investment-driven closure, a feature considered more relevant to developing countries.

There are three categories of factors in the model: labor; land; and capital. The labor market is specified according to the assumptions described earlier. The factor prices for land and capital are solved to clear the market by equating supply and demand (with no excess demand and supply allowed. Such a specification is unaffected by the treatment of factor distortion parameter *FPDIST* (see footnote 5). Even when capital is fixed (in the short-run simulation), implying that factor distortion parameter is endogenous, the factor price of capital remains endogenous.

Regarding the data employed, the 1985 Indonesian SAM is used as the base line. However, some modifications and re-aggregation from the original SAM need to be done to make the intended analysis more meaningful. The aggregation follows that of Lewis (1993). In particular, the original 169 and 38 sectors of IO table and SAM, respectively, were aggregated down to 30 sectors. There are 10 primary inputs classified into three major types: land, capital and labor. The labor factor is broken down further into rural and urban types (five and three, respectively). There are 8 categories of household, six rural and two in urban.

3. Comparative-Static Simulation: One-Period Shock

The first set of simulations is conducted by comparing alternative scenarios within a comparative-static (one-period shock) framework. In each scenario, changes are made not only in the relevant parameter and exogenous (policy) variables, but also in the external variables such as world prices of imports and exports and foreign interest rates. These external shocks apply to all scenarios. Since each is a one-period shock, the outcomes can be related to the situation in one period after the base year, i.e., 1986. In that year, for example, prices of most imports and exports dropped by approximately 10 to 12 percent (data taken from the unit-price of sectoral exports and imports). The foreign interest rate (*RFLOAN*), measured by the London Interbank Offer Rates (LIBOR) on one-year SDR deposits, also shows a drop from 8.4 percent to 6.58 percent.[8] The following are the alternative scenarios.

Scenario 1. This scenario attempts to emulate, as closely as possible, the actual policy response as well as the external conditions that occurred in 1986. In particular, a series of deregulation measures started in this year. The tax reform, implemented in 1985, raised government revenues via an enlargement of the tax-base with reduced tax rates (e.g., reduced *ctax*). Real investment expenditures by government (*GINVTOT*) were practically frozen, although the sectoral composition as reflected in *GINV*, i.e., pro agriculture and pro infrastructure, remained in place. A similar trend also occurred in the government consumption (*GCON*). Such retrenchment has caused fewer financing requirements, including those for foreign borrowing (*BORROW*); in real terms, foreign borrowing has

[8] Data taken from IMF, *International Financial Statistics*, July 1992.

dropped quite considerably. As expected, some expansion took place in many private industries (reduced *csav* because of the existing underutilized capacity). Expecting that the tax reform will begin to show its beneficial results, a move towards trade liberalization was started, mostly through a reduction in import tariffs for manufacturing products (*tm*) and in export tax (*te*). At the same time, a major devaluation took place in September 1986. Along with this trend, the capital account, which has been opened since the early 1970s, received a further boost from the inflows of private capital (parameter *degree* is adjusted upward). All these efforts are reflected, among other things, through a more market-determined price system and less distortion, particularly in the manufacturing labor market (adjusting *FPDIST*), and improved productivity, albeit not too significantly, in intermediate input use (adjusting *ac*).

Scenario 2. The same external variables (*pwm*, *pwe*, *RFLOAN*) and direct policy measures (*GINVTOT*, *GINV*, *EXR*, *degree*, *GCON*, *tm*, *te* and *BORROW*) are applied in scenario 2 as well as in the remaining scenarios (3 to 6). However, these experiments differ from scenario 1 in that they all have uniformity in certain components. First, it is assumed that improvement in the price system is not materialized (unadjusted *FPDIST*), there is no significant impact of the tax reform on corporate tax (unadjusted *ctax*), and no dramatic expansion in the private sector has taken place (unadjusted *csav*). On the other hand, the improved productivity, particularly in the intermediate input use, is greater than in scenario 1. Last, the ease of importing capital goods and other raw materials is assumed to alter the way the total supply Q is allocated, i.e., in favor of greater imports (adjusted η), even with the same rate of substitution in the Armington function.

Scenario 3. The only difference between this and scenario 2 is in the sectoral allocation, not in the total, of government investment. In particular, it is assumed that the government is less concerned with agricultural and other social overhead capital sector. The way the investment expenditures are allocated is biased against the lower income group and more in favor of the manufacturing and business oriented activities.

Scenario 4. This is the same as scenario 3, except that no productivity improvement in the intermediate input use is in effect.

Scenario 5. This is the same as scenario 2, except that trade liberalization is done with no adjustment in the exchange rate (no devaluation). It is obvious that while in scenario 4 one would be able to estimate the role the productivity improvement has in the economy, it is the role of the exchange rate that would be examined in this scenario.

Scenario 6. This is a scenario in which no current and capital account liberalization is performed. More specifically, capital inflows are not encouraged and exports not promoted; neither exchange rate adjustment nor import and export tariff reduction is taken.

The outcomes from testing these six scenarios, indicated by the percentage deviation from the base run, are reported in Table 1.

Looking at the table, it is immediately noticed that from the perspective of income growth, be it growth of real GDP or of household income, scenario 5 provides the most desirable outcomes. Consequently, the size of labor demand is highest under this scenario. Interestingly enough, the inflation rate is also relatively low (higher only in comparison to

Table 1
Selected Variables Under Different Scenarios: One-Period Shock
(percentage deviation from base run)

	Actual Response	No FP & Corp. S & Tax Adj.	Pro. Manuf. Gov. Invest.	No Productiv. Improvmnt	Trade Liberal w/o EXR Adj.	No Policy Reform
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
RGDP	5.17	5.63	5.74	-2.36	6.89	-1.45
Deficit on Current Account	35.00	28.78	56.85	43.63	139.14	90.44
Price Index	0.04	1.60	1.60	1.73	0.69	0.84
Risk	13.07	-2.08	-2.18	2.28	0.10	4.75
Foreign Capital	25.27	15.22	13.01	19.09	8.40	5.10
Foreign Investment	83.41	50.23	42.94	63.01	27.73	16.82
Total Real Investment	-0.86	15.64	21.13	7.63	31.73	11.81
Manufacturing	-1.49	14.97	47.70	35.55	58.36	12.29
Rupiah Export	-0.23	4.82	4.95	-0.14	2.34	-2.74
Manufacturing	0.40	1.22	1.47	-4.25	-1.10	-6.88
Private Consumption	7.90	5.26	5.23	-3.32	8.03	-0.80
Manufacturing	8.79	7.33	7.21	-2.55	10.13	0.10
Labor Demand	4.78	5.37	5.34	-1.81	7.54	0.16
Agricultural	7.15	6.38	6.30	-0.63	7.57	0.52
Manufacturing	-6.74	1.82	2.72	-5.90	4.83	-4.78
Others	5.05	5.18	5.02	-2.04	8.09	0.87
Rural	4.69	5.96	5.85	-1.39	8.01	0.62
Urban	5.04	3.80	4.00	-2.93	6.30	-1.06
Household Income	9.08	7.28	7.32	-0.74	9.17	0.85
Agricultural	7.19	9.43	9.18	0.64	10.46	1.89
Rural	8.30	8.35	8.22	-0.12	10.02	1.56
Urban	10.28	5.64	5.94	-1.70	7.86	-0.25

Source: results of model simulation

scenario 1. Furthermore, the rural-urban distribution of household income is more desirable in the sense that the increase is higher in the rural than in the urban. Why then did the government not select such a scenario?

Under this experiment, the current account deficit will reach an intolerable level. The open capital account system adopted by the country since the early 1970s makes it difficult for the monetary authorities to control capital outflows when devaluation expectation is

high. With a history of two maxi devaluations (1978 and 1983), excessive deficits can easily result in such an expectation. In other words, the level of current account deficit has become a very sensitive issue to the public and the policymakers. It is likely for this reason that a scenario of fixing exchange rates was not preferable.

A greater effect of tax reform on corporate taxes (reduced rates) and an improved price system in few sectors appear to be the case in 1986. On the other hand, productivity improvement is likely to take some time before materializing. A truly major expansion in the business sector, increased in imports of capital goods and raw materials also did not happen until the late 1980s. These are precisely the assumptions adopted in scenario 1; needless to say, they are closer to the real situation.

Under this scenario, real GDP growth is sufficiently high, and so is the growth of household incomes. The devaluation in September 1986 has not created a major impact on the balance of payments in the same year (J-curve effect). The worsening of the current account does not produce an intolerable deficit, and the inflation rate, which is another policy-sensitive indicator in Indonesia, is lowest among all scenarios. Nonetheless, the devaluation has affected country-risk unfavorably. To counter it, several incentives for capital inflows were introduced (parameter *degree* is adjusted upward), such that inflows of capital increased considerably, 25 percent greater than in the base run, despite a greater country-risk. Increased foreign investment and manufacturing exports are also demonstrated in this scenario.

Although in a declining path, the interest rate in 1986 was still a record high. At the same time, most business sectors had not really undertaken a major expansion until the late 1980s. Even if some of them managed to do so, they did not expand the expenditures for new investment because a considerable underutilized capacity was present. As a result, in real terms total investment did not increase, as shown under scenario 1 in table 1.

The rural-urban setting gives a bit less desirable outcome. In relative terms, both the composition of labor demand and household income indicate that the short-run effect of the government response is slightly more in favor of the urban sector, although in absolute terms both the rural and the urban sectors have enjoyed an improvement. Increased consumption is also accompanied by a change in the consumption pattern, i.e., greater share of manufacturing consumption.

The impact of a change in a number of individual variables is now examined. Comparing scenarios 3 and 2 one can observe the overall repercussions produced by government investment allocation. Under scenario 3, the sectoral allocation is hypothetically assumed to deviate from the actual one, in that a smaller portion of the budget is allocated to the agricultural and social overhead capital sectors. Higher growth of GDP and household income is detected, but increased demand for labor in the manufacturing sector is not accompanied by greater demand in the agricultural and services sectors. Yet, the latter constitute the bulk of the labor force in the country. Similarly, less growth of household income under this scenario is also featured by higher and lower rates of income increase in the urban and rural areas, respectively.

Needless to say, in order to generate more desirable outcomes, a productivity improvement is required. Even with all the features described in scenario 2, when productivity improvement does not occur, the intended outcomes are not achievable. This

is clearly shown in scenario 4: GDP and household income decline; inflation is high; and so is the country risk. Consequently, labor demand shrinks across all sectors.

Similar—albeit less damaging—results are produced when no policy response is taken by the government (scenario 6). It is important to note, however, that the urban and export-oriented manufacturing sector is the one that will suffer most from such a do-nothing policy.

4. Macroeconomic Indicators and Rural-Urban Welfare: Multi-Period Simulation

Having investment function and capital stock equations in the model, one can perform a multi-period simulation. Basically, for each period the procedure is similar to that adopted in the analysis of scenario 1 in the preceding section. All external variables and policy measures are adjusted to their actual values, and gradual productivity improvement is assumed. Since one period is commensurate with a one-year time frame, the periods $t_1 ... t_2$ are more or less comparable with 1986...1990.

Several major shocks are worth noting. Exchange rate adjustment is actually largest in t_2 because the yearly exchange rate average following the devaluation in 1986 changed considerably only in 1987. Consequently, a major improvement in the current account also took place in this year.[9] A significant increase in government borrowing, and further opening up of foreign capital also took place in 1987. Marked improvements are detected in the world price of imports and exports in 1988. Another sharp increase in foreign borrowing, this time also done through private sector and public enterprises, occurred in 1989. At the same time, the government's real expenditures increased. In this year, foreign interest rates soared, but further improvement in the environment for increased foreign capital was rendered, reflected by another mark-up in parameter *degree*. Such a situation continued in 1990, the last period of the simulation.[10]

4.1. Macroeconomic Impacts

Although growth of exports, particularly of manufactured products, started to be strong in 1987, trade liberalization also induced more imports. Moreover, a deficit in service trade increased following the deregulation in the shipping sector and increased interest payments due to the stronger yen at that time. With persistent and all-out efforts to boost non-oil exports, an improved balance of payment position was achieved. The Indonesian government also managed to keep the inflation rate in the one-digit range. As shown in Table 2, the controlled inflation rate was indeed produced by the simulation.

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[9] Since the country's current account has always been in deficit since the base year, negative signs in Table 2 indicate an improvement (lower deficit).

[10] For discussions on the economic reform in Indonesia, see Azis (1994), Thorbecke et. al. (1992) and Woo et. al. (1994).

Table 2
Selected Variables Following the Economic Reform: Multi-Period Simulation
(percentage deviation from the base run)

	t_1	t_2	t_3	t_4	t_5
Real GDP	5.17	10.57	16.67	19.33	35.19
Current Account	35.09	-32.70	-64.35	-43.94	-30.23
Price Index	0.04	2.76	3.05	3.34	1.79
Risk	14.20	14.40	2.50	-1.50	2.50
Foreign Capital	24.89	41.44	41.53	44.42	41.53
Foreign Investment	82.80	114.50	96.47	78.97	96.47
Real Investment	-0.86	-6.14	-6.71	0.01	13.89
Rupiah Export	-0.23	6.21	10.16	15.09	20.63
Labor Demand	4.78	6.03	11.62	18.83	26.96
Rural	4.69	5.65	11.00	17.87	25.72
Urban	5.04	7.05	13.27	21.38	30.22

Source: results of model simulation

Concerted efforts to liberalize the economy have resulted in low premium risks throughout the period of observation. Consequently, foreign capital continued to increase, at least until period t_4. However, direct foreign investment declined after t_2, partly because the private and public borrowings constituted an increasing portion of foreign capital, including a number of new types of portfolios. It is important to note that in the late 1980s the stock and capital markets in Indonesia emerged as a significant alternative source of investment, attracting flows of foreign capital that are not recorded as direct foreign investment.

As capacity was nearly fully utilized, real investment began to rise in the late 1980s. Non-oil exports also went up during that period, as did labor demand.[11] The results of the simulation also indicate that the share of manufactured exports increased considerably during the t_0 - t_5 period.

4.2 Rural-Urban Welfare

Of several welfare indicators, the most common and generally well understood is that of actual income received. Rather than the distribution of factor income (often used in neo-classical models), however, the distribution of household income is more appropriate to analyze. Such distribution is reported in Table 3. Following the classification in Table 1, one

[11] An increase in exports (or in general an export-promoting strategy) is, by comparison with import-substitution policy, known to be more favorable for employment generation. See Azis (1992).

can analyze not only the rural-urban distribution of income, but also the distribution of income among different groups within each area.

The first important finding is with respect to the percentage distribution between rural and urban household incomes. The reform program, with all its favorable features and positive macroeconomic repercussions, appears to alter income distribution in favor of urban households, the income share of which increases from 39.3 to 40.2 percent; the rural income share declines from 60.7 to 59.8 percent. Notice also that only the non-agricultural households gain shares in the rural sector; the share of the agricultural household income declines. Even though this does not necessarily imply a worsening condition in the entire agricultural sector—because the absolute income in all groups has actually increased (not reported in the table)—such a trend gives an indication that the non-agricultural sector has been the major winner in the whole episode of the reform program.

In the urban sector, both the poor and the rich are able to raise their income shares. While this type of information is of significant value in the analysis of income distribution, it is not easy to draw a conclusion regarding the overall relative income distribution between income groups. Different population and employment size in each household category may contribute to the above income trend.

Unfortunately, reliable data on population size in each household category are not available. As a proxy, employment size is used. The resulting per-labor household income is reported in Table 4. By setting the per-labor income of *Farm Small* (having the lowest income among household category in the base year) equal to unity, one can observe, with only a single exception (*Agric Workers*), that the relative position of all groups has improved, suggesting that the economic reform has produced a greater welfare in most household

Table 3
Composition of Total Household Income Following the Economic Reform: Multi-Period Simulation

	t_0	t_1	t_2	t_3	t_4	t_5
Rural	60.67%	60.24%	60.14%	60.08%	59.93%	59.83%
Agric. Workers	4.26%	4.17%	4.19%	4.19%	4.15%	4.08%
Farm Small	13.46%	13.21%	13.22%	13.19%	13.10%	12.99%
Farm Medium	6.69%	6.58%	6.59%	6.59%	6.56%	6.52%
Farm Large	12.91%	12.72%	12.75%	12.78%	12.72%	12.67%
Agriculture	37.32%	36.68%	36.75%	36.75%	36.53%	36.25%
Rural Low	12.76%	12.92%	12.80%	12.73%	12.74%	12.92%
Rural High	10.59%	10.64%	10.59%	10.60%	10.66%	10.66%
Urban	39.33%	39.76%	39.86%	39.92%	40.07%	40.17%
Urban Low	20.88%	21.18%	21.19%	21.18%	21.24%	21.41%
Urban High	18.45%	18.58%	18.66%	18.74%	18.83%	18.76%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

categories. Indeed, looking at the resulting per-labor income in absolute terms for all categories, including the poorest group (*Farm Small*), the figures have all risen. Comparing the trend of average per-labor income of rural and urban households, that of the latter has grown faster.

However, an observation of the changes in absolute income suggests that the fastest growing income—roughly 12.2 percent during the period, or 2.3 percent annually—occurred in the *Rural Low* category.[12] Seemingly, this finding lends support to what most reports on income distribution in Indonesia have concluded, i.e., that the overall relative income distribution has improved along with the reduction in the number of people living below the poverty line. But a closer look at the data suggests that the lowest per-capita income is not in *Rural Low* but in *Farm Small*, and that the second lowest is in *Agric. Workers*. This is true in the base year and is also true in the last period of observation (t5). The growth of per-labor income of these two groups is in fact also lowest (see footnote 12). Therefore, the earlier remarks on income distribution are not really true. Along with the description derived from Table 4, this leads one to surmise that the relative income distribution has in fact worsened during the period of observation. In other words, the

Table 4
The Dynamics of Per-Labor Household Income Following Economic Reform: Multi-Period Simulation
(reference index: *Farm Small* = 1)

	t_0	t_1	t_2	t_3	t_4	t_5
Rural	1.41	1.53	1.47	1.53	1.55	1.56
Agric. Workers	1.02	1.02	1.02	1.02	1.02	1.02
Farm Small	1.00	1.00	1.00	1.00	1.00	1.00
Farm Medium	1.44	1.44	1.44	1.45	1.45	1.46
Farm Large	2.36	2.37	2.38	2.39	2.39	2.41
Agriculture	1.46	1.56	1.47	1.53	1.54	1.55
Rural Low	1.24	1.35	1.34	1.34	1.34	1.34
Rural High	2.10	2.23	2.23	2.22	2.22	2.22
Urban	2.41	2.66	2.56	2.65	2.68	2.68
Urban Low	2.03	2.16	2.14	2.13	2.13	2.13
Urban High	3.19	3.30	3.29	3.28	3.27	3.27
Total	1.68	1.84	1.77	1.84	1.87	1.88

Source: results of model simulation

[12] The resulting income growth for each category, not reported in the table, is as follows: *Agric.Workers* 0.7%, *Farm Small* 0.8%, *Farm-Medium* 1%, *Farm Large* 1.1%, *Rural Low* 2.3%, *Rural High* 1.8%, *Urban Low* 1.6%, and *Urban High* 1.2%. Reclassifying, the rural-urban income gap has slightly increased; per-labor income growth in the rural area (14%) is slightly lower than that in the urban area (15%).

assertion that the economic reform program carried out in Indonesia during the 1980s did not result in worsening relative income distribution is not supported by this study.

On the other hand, given the fact that in all categories, including those that constitute the poorest members of society, income has risen, and, even more convincing, that the fastest growing per-labor income has taken place in the *Rural Low* category, the often quoted remark "the rich get richer and the poor get poorer" is clearly unfounded. The second part of the remark is absolutely incorrect.[13]

At this juncture, it is important to note that the values of some major variables from the multi-period simulation have been checked and compared with their actual values found in SAM 1990. As an illustration, the ratios between the actual and estimated values of real GDP and current account in t_5 are, respectively, 1.0016 and 1.0137. In the rural-urban distribution, the actual income shares for the rural sector have slightly declined from 60.4 percent to 57.6 percent. The model simulation gives similar figures, i.e., from 60.7 percent to 59.8 percent. Other indicators also point to a proximity between the actual and estimated values. In short, the model has a fairly good tracking record.

5. Conclusions

The quantitative impact analysis in this paper has been conducted through a series of simulations of a CGE model designed specifically to capture the important components of Indonesia's economic reform and the distribution of household incomes in rural and urban areas. While all prices and nominal wages are endogenous, each with its own equation specification, exchange rate is exogenous. In this sense, the model is neither Keynesian nor Kaleckian.

In the comparative-static simulation, several alternative scenarios have been conducted for two purposes: first, to compare results from the actual policy response with those from a number of counter-factual scenarios; second, to evaluate the impact of some individual variables believed to play a major role in the whole scheme of economic reform. Overall, the simulation results show that the policy actually undertaken by the government in response to some external shocks likely provides positive outcomes in terms of GDP and household income growth, although some alternative scenarios could produce better results in terms of rural-urban income distribution. But if the allocation of government investment were altered, making it less in favor of agricultural and social overhead capital, income distribution could have been worse.

In the dynamic (multi-period) simulation, actual data on labor supply for each year have been used such that rural-urban migration is already taken into account. From the simulation with close-to-actual policy responses, the time-paths of major macroeconomic variables have been traced. While GDP is constantly growing, it takes one-year for exports to start to expand. A similar path is found for the current account position, with inflation basically under control. Even though for all categories household incomes have increased, in

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[13] Similar conclusions on poverty alleviation are found in a number of other studies such as Thorbecke and Pluijm (1993).

the end-period the share of agricultural sector declines—albeit very slightly—resulting in a lower income portion for the total rural area. In this regard, the non-agricultural sector appears to be the major beneficiary of the reform.

Measured by per-labor income, the relative position of the lowest income groups, i.e., *Farm Small* and *Agric.Workers* has not improved. This can be an indication that during the reform period the relative income distribution has slightly worsened. On the other hand, the fastest growing per-labor income occurred in the *Rural Low* category. Such a trend, along with the fact that per-labor income of all groups has increased, lends strong support to the often-quoted assertion that the country has managed to reduce the level of poverty.

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Appendix

List of Equations of the CGE Model

Output-supply and Factor-demand

$X_i = AX_i \,.\, [\delta_i VA_i^{\rho i} + (1-\delta_i).\, INTM_i^{-\rho i}]^{-1/\rho i}$ $i \in n$ (1)

$X_i = Va_i$ $i \notin n$

$VA_i = AV_i \,.\, [\Sigma_f \beta_{i,f} .PRINPUT_{i,f}^{-\mu i}]^{-1/\mu}$ (2)

$PRINPUT_{i,f} = VA_i \,.\, [\beta_{i,f} .\, PVA_i / (AV^{\mu i} .\, FP_f .\, FPDIST_{i,f})]^{-1/\mu}$ (3)

$INTM_i = VA_i / [(PINTM_i/PVA_i).\, (\delta/(1-\delta))]^{1/(1+\rho i)}$ $i \in n$ (4)

$INTM_i = 0$ $i \notin n$

$X_i = AT_i \,.\, (\gamma_i E_i^{\alpha i} + (1-\gamma_i).D_i^{\alpha i})^{1/\alpha i}$ $i \in exp$ (5)

$X_i = D_i$ $i \notin exp$

$E_i = D_i \,.\, [PE_i / (PD_i(1-tv_i-tx_i)) \,.\, (1-\gamma_i)/\gamma_i]^{1/(\alpha i-1)}$ $i \in exp$ (6)

$E_i = 0$ $i \notin exp$

$Q_i = AC_i \,.\, [\eta_i M_i^{-\beta i} + (1-\eta).D_i^{-\beta i}]^{-1/\beta i}$ $i \in imp$ (7)

$Q_i = D_i$ $i \notin imp$

$M_i = D_i \,.\, [(PD_i/PM_i) \,.\, \eta_i / (1-\eta_i)]^{1/(1+\beta i)}$ $i \in imp$ (8)

$M_i = 0$ $i \notin imp$

Aggregate Demand

$INTMTOT_i = \Sigma_j (aa_{ij} \,.\, INTM_j)$ (9)

$PC_i = [\Sigma_{hh} cc_{i,hh} \,.\, (1-mps_{hh}).YHH_{hh} .(1-th_{hh})] / PQ_i$ (10)

$GC_i = gg_i.GCON$ (11)

$ID_i = \Sigma_j (capmat_{ij} \,.\, DK_j)$ (12)

$INVEN_i = inv_i \,.\, X_i$ (13)

Prices

$PX_i = [PD_i D_i(1-tx_i-tv_i) + PE_i E_i] / X_i$ (14)

$PQ_i = [PD_i D_i + PM_i M_i] / Q_i$ (15)

$PVA_i = [PX_i X_i - PINTM_i .INTM_i] / Va_i$ (16)

$PK_i = \Sigma_j \{capmat_{j,i} .[PQ_j - (PD_j D_j + pwm_j M_j EXR).tv_j/Q_j]\}$ (17)

$PM_i = pwm_i EXR \,.\, (1 + tm_i) \,.\, (1+tv_i)$ (18)

$PE_i = pwe_i \,.\, EXR \,.\, (1 - te_i)$ (19)

$PINTM_i = \Sigma_j \{aa_{j,i} \,.\, [PQ_j - (PD_j D_j + pwm_j M_j EXR).tv_j/Q_j]\}$ (20)

$PINDEX = \Sigma_i wtq_i PQ_i$ (21)

$PINDOM = \Sigma_i wtd_i PD_i$ (22)

Income and Saving

$YF_f = \Sigma_i (FP_f \,.\, FPDIST_{i,f} \,.\, PRINPUT_{i,f})$ (23)

$$YCORP = (YF_{capital} - YTR_{agrcap} + \Sigma_{ivat} [(\Sigma_j capmat_{j,ivat} \,.\, PQ_j - PK_{ivat}) \,.\, DK_{ivat}] - OILTAX + EXR.FACTIN - EXR.(REPAT + INTEREST_{Public} + INTEREST_{Private}$$ (24)

$YTR_{land} = YF_{land}$ (25)

$YTR_{agrcap} = \Sigma_{iag} FP_{capital} FPDIST_{iag,capital} PRINPUT_{iag,capital}$ (26)

$YTR_{corp} = YCORP.(1-ctax).(1-csav)$ (27)

$YHH_{hh} = \Sigma_{il} ilhh_{hh,il} .YF_{il} + \Sigma_{inl} inlhh_{hh,inl} .YTR_{inl}$ (28)

$PRINPUTH_{hh} = \Sigma_{il} emphh_{hh,il} \,.\, \Sigma_i PRINPUT_{i,il}$ (29)

$$YCAP_{hh} = YHH_{hh} / PRINPUTH_{hh} \quad (30)$$

$$HHSAV = \Sigma_{hh}\, mps_{hh} . YHH_{hh} . (1 - th_{hh}) \quad (31)$$

$$TARIFF = \Sigma_i\, tm_r . M_r . pwm_r . (1 + tv_i) . EXR \quad (32)$$

$$INTAX = \Sigma_i\, tx_i . PD_i . D_i \quad (33)$$

$$VAT = \Sigma_{ivat}\, PD_{ivat} . D_{ivat} . tv_{ivat} + \Sigma_{ivat}\, pwm_{ivat} . M_{ivat} . EXR . tv_{ivat}$$
$$\Sigma_{ivat} [\, (\Sigma_j\, aa_{j,ivat} . PQ_j - PINTM_{ivat}) . INTM_{ivat}\,]$$
$$\Sigma_{ivat} [\, (\Sigma_j\, capmat_{j,ivat} . PQ_j) - PK_{ivat}) . DK_{ivat}\,] \quad (34)$$

$$EXPTAX = \Sigma_i\, te_r . pwe_r . E . EXR \quad (35)$$

$$OILTAX = oilrate . \Sigma_{ioil}\, FP_{capital} . FPDIST_{ioil,capital} . PRINPUT_{ioil,capital} \quad (36)$$

$$CORPTAX = YCORP . ctax \quad (37)$$

$$HHTAX = \Sigma_{hh}\, th_{hh} . YHH_{hh} \quad (38)$$

$$GREV = TARIFF + EXPTAX + INTAX + HHTAX + VAT + CORPTAX + OILTAX \quad (39)$$

$$GSAV = GREV - \Sigma_i\, PQ_i . GC_i - EXR . INTEREST_{Government} \quad (40)$$

$$CORPSAV = YCORP . (1 - ctax) . csav \quad (41)$$

$$DCA = \Sigma_i\, pwe_r . E_i - \Sigma_i\, pwm_r . M_i + FACTIN - REPAT - \Sigma_{br}\, INTEREST_{br} \quad (42)$$

$$SAVING = HHSAV + GSAV + CORPSAV - DCA . EXR \quad (43)$$

$$GDPVA = \Sigma_i\, PVA_r . VA_i + INTAX + TARIFF \quad (44)$$

Investment and Capital Flows

$$FCAP = \sigma_0 + degree . \sigma_1 . (RLOAN - RFLOAN - RISK - ((EXR/EXR0) - 1)) \quad (45)$$

$$RISK = \alpha_0 + \alpha_1 . [(\Sigma_{br}\, AMORT_{br} + \Sigma_{br} INTEREST_{br}) / \Sigma_i E_i . pwe_i] \quad (46)$$

$$FORINV = FCAP - BORROW_{Public} - BORROW_{Private} \quad (47)$$

$$DFR = \Sigma_{br}\, AMORT_{br} - BORROW_{br} - FORINV - DCA \quad (48)$$

$$PINV_i = \lambda_r VA_i^{\lambda 1i} . (1 + RLOAN)^{\lambda 2i} \quad (49)$$

$$PINVTOT = \Sigma_i\, PINV_i \quad (50)$$

$$GINVTOT = \Sigma_i\, GINV_i \quad (51)$$

$$INVEST = \Sigma_i\, (GINV_i + PINV_i) \quad (52)$$

$$DK_i = (GINV_i + PINV_i - inv_r . X_r . PQ_i) / \Sigma_j\, capmat_{j,i} . PQ_j \quad (53)$$

$$KSTOCK_i = (1.0 - DEPR_i) . PRINPUT_{i,capital} + Dk_i \quad (54)^*$$

Labor Market

$$WAGES_i = PINDEX^{vi/1.5} . (PVA_i/PVA0_i)^{(1-vi)/1.5} . (X/\Sigma_{il}\, PRINPUT_{i,il} / PDL0)^{ni} \quad (55)$$

$$FP_{il} = FP0_{il} . \Sigma_i\, WAGES_i . wshare_{i,il} \quad (56)$$

$$PDL_i = X_i / \Sigma_{il}\, PRINPUT_{i,il} \quad (57)$$

$$UNEM = LBSUP - \Sigma_{il} \Sigma_i\, PRINPUT_{i,il} \quad (58)$$

Market Clearing

$$Q_i = INTMTOT_i + PC_i + GC_i + ID_i + INVEN_i \quad (59)$$

$$SAVING = INVEST \quad (60)^{**}$$

Objective Function

$$RGDP = \Sigma_i\, (PC_i + INVEN_i + ID_i + GC_i) + \Sigma E_i - \Sigma_i\, (1.0 - tmbase_i) M_i \quad (61)$$

Notes:

* Eq. (54) is inserted in the multi-period simulations.

** Eq. (60) is not explicitly inluded in the system; its function is merely to check Walras' Law.

Subscripts

i,j	*Production sector*
f	*Factors of production*
ivat	*Value-added sector*
il	*Labor institution*

inl	*Non-labor institution*
br	*Borrowing institution*
hh	*Household category*
n	*Sectors with intermediate inputs*
exp	*Sectors with exports*
imp	*Sectors with imports*

Notations for the Variables and Parameters

Variables (underline indicates exogenous)

Output Supply and Factor Demand

D_i	*SALES OF DOMESTIC OUTPUT*
E_i	*EXPORTS*
M_i	*IMPORTS*
$INTM_i$	*COMPOSITE INTERMEDIATE INPUTS*
VA_i	*VALUE ADDED*
X_i	*DOMESTIC OUTPUT*
$PRINPUT_{f,i}$	*FACTOR DEMAND BY SECTOR*
Fpf	*AVERAGE (ACROSS SECTOR) FACTOR PRICE*
$FPDIST_{f,i}$	*FACTOR PRICE DISTORTION*

Aggregate Demand

$INTMTOT_i$	*TOTAL INTERMEDIATE DEMAND*
PC_i	*SECTORAL FINAL DEMAND FOR PRIVATE CONSUMPTION*
GC_i	*SECTORAL FINAL DEMAND FOR GOVERNMENT CONSUMPTION*
GCON	*TOTAL VOLUME OF GOVERNMENT CONSUMPTION*
ID_i	*SECTORAL FINAL DEMAND FOR PRODUCTIVE INVESTMENT*
$INVEN_i$	*INVENTORY INVESTMENT BY SECTOR*

Prices

EXR	*EXCHANGE RATE (Rupiah per U.S. Dollar)*
PD_i	*DOMESTIC SALES PRICES*
PE_i	*DOMESTIC PRICES OF EXPORTS*
PINDEX	*COMPOSITE PRICE INDEX*
PINDOM	*DOMESTIC PRICE INDEX*
PK_i	*PRICE OF CAPITAL GOODS BY SECTOR OF DESTINATION*
PM_i	*DOMESTIC PRICE OF IMPORTS*
$PINTM_i$	*INTERMEDIATE INPUT PRICE BY SECTOR*
PQ_i	*PRICE OF COMPOSITE GOODS (SUPPLY)*
PVA_i	*VALUE ADDED PRICES*
PX_i	*AVERAGE OUTPUT PRICES*

Income and Saving

YHH_{hh}	*HOUSEHOLD INCOME*
YTR_{inl}	*NON-LABOR INSTITUTIONAL INCOME*
YF_f	*FACTOR INCOME*
YCORP	*CORPORATE INCOME*
REPAT	*REPATRIATED PROFITS*
FACTIN	*INTEREST AND REMITTANCE INCOME FROM ABROAD*
$YCAP_{hh}$	*PERCAPITA HOUSEHOLD INCOME*

CORPTA X	*CORPORATE TAXES*
EXPTAX	*EXPORT TAX REVENUE*
GSAV	*GOVERNMENT SAVINGS*
GREV	*GOVERNMENT REVENUE*
$PRINPUTH_{hh}$	*EMPLOYMENT BY HOUSEHOLD TYPE*
HHSAV	*HOUSEHOLD SAVINGS*
INTAX	*INDIRECT TAX REVENUE*
CORPSAV	*CORPORATE SAVINGS*
OILTAX	*OIL TAX REVENUE*
TARIFF	*TARIFF REVENUE*
HHTAX	*HOUSEHOLD TAX REVENUE*
VAT	*VALUE ADDED TAX REVENUE*
SAVING	*TOTAL SAVINGS*
GDPVA	*GDP AS SUM OF VALUE ADDED IN MARKET PRICES*

Investment and Capital Flows

FORINV	*NET DIRECT FOREIGN INVESTMENT*
DFR	*CHANGE IN FOREIGN RESERVES*
DCA	*CURRENT ACCOUNT BALANCE*
$\underline{BORROW}_{br}$	*FOREIGN BORROWING*
$\underline{AMORT}_{br}$	*PAYMENTS OF AMORTIZATION ON FOREIGN DEBT*
$\underline{INTEREST}_{br}$	*INTEREST PAYMENTS ON FOREIGN DEBT*
RLOAN	*DOMESTIC LOAN INTEREST RATE*
RISK	*COUNTRY RISK*
FCAP	*FOREIGN CAPITAL (BORROWING PLUS FOREIGN INVESTMENT)*
PINVTOT	*TOTAL PRIVATE INVESTMENT*
GINVTOT	*TOTAL GOVERNMENT INVESTMENT*
INVEST	*TOTAL INVESTMENT*
$PINV_i$	*SECTORAL PRIVATE INVESTMENT*
DK_i	*VOLUME OF INVESTMENT BY SECTOR OF DESTINATION*
$KSTOCK_i$	*CAPITAL STOCK AT THE BEGINNING OF THE FOLLOWING YEAR*

Labor Market

$WAGES_i$	*SECTORAL WAGES*
UNEM	*TOTAL UNEMPLOYMENT*
PDL_i	*LABOR PRODUCTIVITY*

Market Clearing

Q_i	*SUPPLY OF COMPOSITE GOODS*

Objective Function

RGDP	*REAL GDP*

Parameters and other Exogenous Variables

mps_{hh}	*MARGINAL PROPENSITY TO SAVE BY HOUSEHOLD TYPE*
RFLOAN	*FOREIGN INTEREST RATE*
ϖ_i	*WAGE ELASTICITY FOR PRICE INDEX*
π_i	*WAGE ELASTICITY FOR LABOR PRODUCTIVITY*
csav	*SAVINGS RATE FOR CORPORATIONS*
ctax	*TAX RATE FOR CORPORATE INCOME*
gg_i	*SECTORAL SHARES OF GOVERNMENT CONSUMPTION*

$oilrate$	TAX RATE ON CAPITAL INCOME OF THE OIL SECTOR
ε_i	EXPONENT FOR ARMINGTON FUNCTION
τ_i	EXPONENT FOR CET FUNCTION
η_i	CES (ARMINGTON) FUNCTION SHARE PARAMETER
μ_i	EXPONENT FOR VALUE ADDED FUNCTION
ρ_i	EXPONENT FOR OUTPUT PRODUCTION FUNCTION
v_i	COEFFICIENT IN THE WAGE ELASTICITY
te_i	EXPORT TAX RATES
tm_i	TARIFF RATES ON IMPORTS
tv_i	VALUE ADDED TAX RATES
tx_i	INDIRECT TAX RATES
th_{hh}	HOUSEHOLD TAX RATE
λ_i	SHIFT PARAMETER FOR PRIVATE INVESTMENT
$\lambda 1_i$	VALUE-ADDED ELASTICITIES FOR PRIVATE INVESTMENT
$\lambda 2_i$	DOMESTIC INTEREST RATE ELASTICITIES FOR PRIVATE INVESTMENT
α_0	INTERCEPT FOR RISK EQUATION
α_1	COEFFICIENT FOR RISK EQUATION
$degree$	DEGREE OF OPENESS OF CAPITAL ACCOUNT
σ_1	COEFFICIENT FOR FOREIGN CAPITAL RELATED TO "degree"
σ_0	INTERCEPT FOR FOREIGN CAPITAL (AUTONOMOUS)
aa_{ij}	INPUT-OUTPUT COEFFICIENT
ac_i	ARMINGTON FUNCTION SHIFT PARAMETER
at_i	CET FUNCTION SHIFT PARAMETER
av_i	VALUE ADDED FUNCTION SHIFT PARAMETER
ax_i	OUPUT PRODUCTION FUNCTION SHIFT PARAMETER
bc_i	ARMINGTON FUNCTION SHARE PARAMETER
$cc_{i,hh}$	CONSUMPTION ALLOCATION PARAMETER
bt_i	CET FUNCTION SHARE PARAMETER
β_{if}	FACTOR SHARE PARAMETER FOR VALUE ADDED FUNCTION
δ_i	OUTPUT PRODUCTION FUNCTION SHARE PARAMETER
$tmbase_i$	REAL TARIFF RATE
wtd_i	SECTORAL WEIGHTS FOR DOMESTIC PRICE INDEX
wtq_i	SECTORAL WEIGHTS FOR COMPOSITE PRICE INDEX
$wshare_{i,j}$	SECTORAL WEIGHTS FOR LABOR WAGES
$GINV_i$	SECTORAL GOVERNMENT INVESTMENT
inv_i	RATIO OF INVENTORY INVESTMENT TO GROSS OUTPUT
$LBSUP$	AGGREGATE LABOR SUPPLY
$capmat_{i,j}$	CAPITAL MATRIX
pwe_i	WORLD PRICE OF EXPORTS
pwm_i	WORLD PRICE OF IMPORTS
$ilhh_{hh,il}$	COEFFICIENT FOR MAPPING FACTOR INCOME TO LABOR HOUSEHOLD
$inlhh_{hh,inl}$	COEFFICIENT FOR MAPPING FACTOR INCOME TO NON-LABOR HOUSEHOLD
$emph_{hhh,il}$	COEFFICIENT FOR MAPPING LABOR DEMAND INTO HOUSEHOLD CATEGORY
$DEPR_i$	SECTORAL DEPRECIATION RATE