

Cororaton, Caesar B.

Working Paper

Economy-Wide Model of the Philippine Economy: Preliminary Version

PIDS Discussion Paper Series, No. 1997-07

Provided in Cooperation with:

Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Cororaton, Caesar B. (1997) : Economy-Wide Model of the Philippine Economy: Preliminary Version, PIDS Discussion Paper Series, No. 1997-07, Philippine Institute for Development Studies (PIDS), Makati City

This Version is available at:

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Philippine Institute for Development Studies

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DISCUSSION PAPER SERIES NO. 97-07

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February 1997

For comments, suggestions or further inquiries please contact:

The Research Information Staff, Philippine Institute for Development Studies

3rd Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines

Tel Nos: 8924059 and 8935705; Fax No: 8939589; E-mail: publications@pidsnet.pids.gov.ph

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Economy-Wide Model of the Philippine Economy: Preliminary Version

Caesar B. Cororaton¹

I. Introduction

The paper presents the simulation results of the economic adjustments during the period 1987-1993 using the Jemio and Vos (1993) financial computable general equilibrium model (FCGE). The analyses of the simulation results focus on the impact of the adjustments on the macroeconomy (i.e., GDP, prices, sectoral production, fiscal and trade balance) and on factor payments and income distribution.

The simulation period which covers the years from 1987 to 1993 was selected because of wide economic fluctuations during the period; the economy performing from a peak of 6.8 percent growth in GDP in 1988 to a low of -0.8 percent in 1991, with inflation rate reaching a high of 18.7 percent 1991. During the period the government embarked on a number of structural adjustment and stabilization programs to improve the efficiency of the economy and to stabilize it.² In the past few years, inflation rate dropped dramatically and real GDP growth started to improve. The long-term effects of these programs may yet to be realized, but certainly the micro impacts of these adjustments may have already been felt at the household level but remain unobserved because that are no available indicators. The major objectives of the MIMAP project are to look into these micro impacts of the adjustments. Thus, towards this end the present simulation exercise attempts to translate changes in macro policies during the period to impacts at the sectoral and household income levels. The results will be further translated into impacts on household outcomes (nutrition, health and education). However, this part will not be done here, but in the other components of the MIMAP project.

The analyses, however, are preliminary because the original JV model will still have to be updated to come up with a final version that accounts for the following: (1) the recently constructed 1990 Social Accounting Matrix (SAM) as the database to calibrate the FCGE model; (2) the recent parameter estimates of the elasticities of the model; and (3) the expanded sectoral breakdown of the production sector and the household income groups in the model. The updated FCGE model will have 34 production sectors, 10 household types (in decile), 2 types of assets; physical and financial assets. The financial assets are further broken into 7 different forms. However, the theoretical structure of the original JV model will be retained in the updated version.

The construction of the updated FCGE model is underway. Some of the necessary data

¹Research Fellow, Philippine Institute for Development Studies. Research Assistance was provided by Connie Chua.

²Structural adjustments such as trade liberalization, financial liberalization, and the like, are used to address both efficiency and production-related problems in the economy. Stabilization policies such as tight money and fiscal restraint, on the other hand, are used to reduce aggregate demand so as to reduce inflationary pressures and therefore stabilize the economy.

inputs from the 1990 SAM and the computer program codes have already been set up in GAMS. However, finetuning of the model will still have to be done before it can be used for policy simulation exercises.

The paper is divided into 5 sections. The next section discusses the basic features of the JV model. The third section will give a detailed discussion on how the baseline solution was arrived at, focusing in particular on how the values of the exogenous variables in the model were computed. Furthermore, the section will show the parameter estimates (elasticities) used in the simulations. The fourth section will discuss the 10 policy experiments conducted, specifically, the assumptions in each of the experiments and the respective results. The last section will draw preliminary policy insights based on the results of the simulations.

II. The Model: The Jemio and Vos (JV) Model

The JV model is a dynamic FCGE model of the Philippine economy. It has 6 production sectors, and 7 institutions (4 non-financial institutions and 3 financial institutions). One of the non-financial institutions is the household sector which is broken down into 3 household types (see Table 1). The model incorporates the following assets into the system: physical capital (unincorporated capital and corporate capital) and financial assets (money, government securities, bank deposits and foreign exchange). The model was calibrated using the 1987 Social Accounting Matrix of the Philippine economy developed by VOS (1992). A full description of the functional forms and equations of the model is shown in the Appendix. The discussion in this section will focus only on its key features.

II.A. Investment Constraint

One of the distinguishing characteristics of the model is the explicit identification of the alternative constraints that bind investment demand. For example, investment pattern of each of the main institutional sectors is affected by various financing constraints: domestic finance and foreign exchange availability. The following equations describe the investment behavior of institutions

$$(1) \quad IR = \min(IRF, IRE, IRB)$$

where IR is the realized investment, IRF the accelerator determined investment demand, IRE the foreign exchange constrained maximum investment level, and IRB the finance constrained maximum investment level. Realized investment is the minimum of these three constraints.

The accelerator determined investment is given by

$$(2) \quad IRF_t = IR + \gamma_1 * IR_{t-1} + \gamma_2 * (GDP_t - GDP_{t-1})$$

The foreign exchange constrained maximum investment level is a function of import capacity (CM)

$$(3) \quad IRE_t = IR_0 * (CM_t/CM_0)$$

The credit availability to finance investment demand depends on (a) exogenous capital inflows; (b) asset demand of each agents, i.e., their portfolio choice between different types of assets; and (c) reserve and credit management of the Central Bank (CB). The portfolio choice behavior of agents depends upon the relative profitability of the different types of financial assets in the system. Relative profitability in turn depends on interest rates of the different financial assets and the foreign exchange rate. Asset demand functions are of CES-type with the desired asset structure being a function of relative profitability of the different types of financial assets in the system. That is,

$$(4) \quad AA_{k,K} = (\alpha_{k,K} / \alpha_{k,KT}) \cdot (rf_{k,K} / (rk_k)^{\sigma_k}) \cdot KN_k$$

where $\alpha_{k,K}$ is the share of financial asset K of agent k's total asset portfolio and $\alpha_{k,KT}$ the share of the agent's physical capital stock (KN) in its total asset portfolio, while σ_k is the elasticity of substitution for agent's portfolio.

How does this budget constraint work? Private companies normally borrow from the banks. The credit-creating capacity of the banks is constrained by their deposits and liabilities, and by the CB's reserves (which is tied up to foreign reserves). Thus, credit-creating capacity of the banks, and thereby investment of private companies, is budget-constrained by monetary control of the CB. Also, the fact that the government is a preferential borrower of the CB provides another constraint to the credit-creating capacity of the banks through crowding-out effects. Furthermore, when the government issues high-yielding government bonds and securities, it results in substitution of asset demand of households and other institutions away from bank deposits which restricts the credit-creating capacity of the banks.

II.B. Price Formation

Another important feature of the JV model is that it captures price rigidities in sectors dominated by modern, oligopolistic sectors where excess capacity and mark-up pricing are present. Sectors outside of agriculture and mining are modelled using mark-up pricing rules.

In principle, adjustment in the mark-up sectors takes place through changes in the level of output, while prices are determined through the mark-up rule. Output adjustment, however, cannot take place indefinitely. There is a maximum output which is set either by the availability of foreign exchange to import intermediate inputs or by the total supply of labor. Once output has reached that constrained maximum (X_j^{\max}), further increases in demand will be matched by higher mark-up levels. (see A.4.2 in the Appendix).

II.C. Trade Sector

Exports by commodity are determined through a constant foreign price elasticity of demand. Exports are responsive to changes in export prices (PE_i) relative to domestic prices (PD_i), i.e.,

$$(5) \quad E_i = E_{i0}(PE_i/PD_i)^{\epsilon_i}$$

The world export price of commodities is converted into domestic prices through the foreign exchange rate. Thus, changes in the exchange rate affect the relative price of exports and the demand for exports.

The general form of the demand for imports is given by

$$(6) \quad M_j = a_{mpj} \cdot (PM_j/PD_j)^{-p_j} \cdot X_j$$

where a_{mpj} is the input-output coefficient for imported inputs in sector j . PM_j is the domestic price of imports, computed in the following manner: (exchange rate) \times (the world price of imports) \times (1 + tariff). Thus, changes in the exchange rate affect the relative price of imports and the demand for imports. For both agriculture and mining sectors, p_j is non-zero, which means that there is some degree of substitution between domestically produced and imported inputs of these sectors. For the rest of the sectors, which are the mark-up sectors, there are no substitution possibilities, thus in this case p_j is set to zero.

II.D. Exchange Rate

The model assumes a "dual" exchange rate determination: the determination of the official exchange rate and the parallel exchange rate. The parallel exchange rate clears the total excess demand for foreign exchange in the parallel markets, at which mainly factor payments and current transfers received by households from abroad (consisting largely of workers' remittances, which are exogenous in the model) and household demand for foreign assets are transacted. The official exchange rate, however, is fixed and is considered as a policy variable³. The variables that are affected by the official exchange rate are the trade variables (exports and imports through their relative prices), all external borrowing by all institutions (which is set exogenously), and the minimum desired level of foreign exchange reserves held in the CB.

II.E. Closure Rules

Since the official exchange rate is exogenous and considered a policy variable, the model is closed through changes in the CB's exchange reserves⁴. However, when the reserves of the CB dry up (or when the reserves reach a certain desired minimum level) and when a foreign exchange constrained situation occurs, import capacity acts as the overall closure of the model. When this happens, the CB's credit to the private banks adjusts accordingly, the credit of development banks to households also adjusts, government institutions adjust their investment downwards, and both households and private companies adjust their investment in the same manner.

³In the updated version of the model, the official exchange rate may have to be endogenously determined to account for the liberalization of the foreign exchange market in the early 1990s.

⁴This closure rule may have to be modified if, in the updated version of the model, the official exchange rate is endogenously determined.

III. Baseline Solution

The values of the variables discussed in this section were used to compute for the baseline solution. Note that all these values are actual values (unless otherwise stated) of each of the variables from 1987 to 1993. The values of the variables are shown in Table 2.

1. Real exchange index. The index of real exchange rate was derived using trade weighted real Philippine peso and real US dollar and real Japanese yen. The base year of the index is 1987. Real exchange rate computed in this manner will show a real appreciation of the peso beginning 1989 (see Figure 1). The Philippine peso gained in real terms by 6.8 percent in 1989 and by another 11.5 percent in 1992 (see Table 3).
2. World interest rate. World interest rate is indicated by the Singaporean interest rate.
3. Administered domestic interest rate. Administered interest rate was derived using the rate that was used to calibrate the model in 1987 and the actual annual movement of the local 91-day Treasury bill rate (TBR).⁵ That is, the 17 percent rate used in 1987 to calibrate the model was "spliced" with the 91-day TBR to derive the rates for the succeeding years.
4. Real government consumption. Real government consumption was derived using the value that was used to calibrate the model in 1987 and the actual annual movement of real government consumption from the National Income Accounts (NIA). That is, the 1987 value of government consumption in the model was "spliced" with the actual real government consumption to derive the values for the remaining years in the simulation period. One will note from the derived series that real government consumption declined by -2.13 percent in 1991 and by another -0.88 percent in 1992. This decline was in part due to the budget cutting program during the period.
5. Net factor income from abroad. Net factor income from abroad was derived using the 1987 value in the calibration of the model and actual annual movement of the inflows of personal income in the BOP accounts. Again, "splicing" method was used to derive the values for the remaining years in the simulation period.
6. Government investment. Real investment was derived using the 1987 value in the calibration and the actual annual movement of real government construction from the NIA. "Splicing" method was used to generate values for the remaining years in the period. One will observe that there is a significant drop in real government construction in 1991. From a high growth of 55.4 percent in 1990, real government construction dropped by -31 percent in 1991. Again, this was part of the austerity measure in the stabilization program during the period. Some recovery in real government construction, though, was seen in 1992 and 1993.

⁵Generally, all other interest rates follow the movement of the 91-day TBR. At the height of the speculative attack of the peso in the mid 1980s and early 1990s, for example, the 91-day TBR was used as one of the monetary instruments to stabilize the monetary system.

7. Minimum level of exchange reserves. This variable is called MERIS9 in the model, and is normally used to simulate changes in monetary control in the system. For example, this variable can be manipulated downwards to simulate a situation where tight monetary policy prevails. Thus, for the baseline simulation, the values of MIREs were derived using the 1987 value in the calibration of the model and the actual movement of reserve money of the Central Bank. The latter variable, however, was converted to "foreign currency units" using the real exchange rate computed in item #1 above.
8. Terms of trade. This is the actual terms of trade (TOT); the ratio between the official export and import price indices. In the simulation, a uniform TOT was applied to agriculture, mining, and manufacturing industries.
9. External debt. This is indicated by the annual change in the outstanding foreign exchange liabilities of major institutions which include: the Central Bank, government banks, private banks, national government, and private corporations.
10. Debt relief. This is indicated by the debt reduction revaluation adjustments in the BOP accounts.
11. Tariff rates. The sectoral tariff rates were derived using the implicit tariff rates computed by Manasan (1995)⁶ for the years 1988 and 1992. In the computation of the industry implicit tariff rates, Manasan included the following taxes: nominal tariffs, duty exemptions, discriminatory excise taxes, BOI incentives, duty drawbacks, and VAT exemptions. To compute for the average tariff rates according to the present model's sectoral classification, import data in the 1988 Input-Output table were used as weights. One will observe that there has been a general decline in the implicit tariff rates from 1988 to 1992, although marginally. This is due to the government's tariff reduction program. Straight line method was used to interpolate the implicit tariff rates for years between 1988 and 1992, including 1993.
12. Current transfers from institution from the rest of the world. This was derived using the 1987 values in the model calibration and the actual annual movement of net transfers in the BOP accounts. Again, "splicing" method is used to derive the values for the remaining years.

Table 4 shows the values of the spending propensities and elasticities used in the model. Most of the average spending propensities are directly derived from the 1987 SAM which Vos developed, while the elasticities reflect a combination of econometric estimates derived from Lamberte et al 1992, borrowed estimates from other studies (PIDS 1989) and guesstimate of Jemio and Vos (e.g. portfolio response elasticities).

⁶"Refinements in the EPR Estimation" (USAID, 1995).

IV. Policy Experiments

IV.A. Definition of Scenario Runs

Apart from the baseline simulation, ten other simulation runs are conducted. Each of the simulations attempts to analyze the effects of the adjustments undertaken during the period 1987-1993. The definition of the ten different scenarios are as follows (the values of the appropriate variables are shown in Table 5):

Scenario 1: This scenario is called *constant exchange rate*. We have seen in the baseline that the peso gained in real terms starting 1989. The local currency vis-a-vis the US dollar and the Japanese yen appreciated in real terms by 6.8 percent in 1989 and other 11.5 percent in 1992. This scenario attempts to analyze the effects of not allowing the exchange rate to appreciate or depreciate. Thus, the value of the variable ER9 is one and constant all through out the simulation period 1987 to 1993. As discussed in the previous section (in particular, item # 7), the adjustment in the ER9 will have a direct effect on MIRE9. Thus, MIRE9 in this scenario is a bit higher than the baseline values starting in 1989. Except for these two variables all other variables are the same as in the baseline in this simulation run.

Scenario 2: This scenario is called *aggressive exchange rate*. This scenario attempts to analyze the impact of not allowing the peso to appreciate, but allowing it to depreciate instead. Thus, the appreciation of 6.8 percent in 1989 and 11.5 percent in 1992 was replaced by a zero change, while the slight depreciation in 1988, 1990, 1991 and 1993 was retained. Thus, in this scenario, the peso is 14 percent lower in real terms than in 1987. Again, this adjustment has a directed impact on the MIRE9.

Scenario 3. This scenario is called *no cut in government consumption*. As part of the austerity measure of the government during the stabilization period in the early 1990s. government consumption declined in real terms. This scenario attempts to analyze the impact of allowing a real government consumption growth of 6 percent in both 1991 and 1992. As a result, the value of government consumption in 1993 is 15.6 percent higher in this scenario compared to the baseline.

Scenario 4. This scenario is called *no cut in government construction (or investment)*. This scenario will attempt to analyze the impact of replacing the -31 percent drop in real government construction in 1991 by a growth of 20 percent during the year. This, in effect, increases the value of the variable by 73 percent in 1993 under this scenario compared with the baseline value.

Scenario 5. This scenario is called *no reduction in government consumption and construction*. This scenario attempts to analyze the impact of combining Scenarios 4 and 5.

Scenario 6. This scenario is called *relaxed monetary policy*. The growth of reserve money of the Central Bank decelerated from 28 percent in 1989 to 21.8 percent in 1990, to 13.9 percent in 1991 and to 11.1 percent in 1992. There was however a slight improvement in the growth of reserve money in 1993 to 15.7 percent. This scenario attempts to analyze the impact of not

allowing the growth of reserve money to dip down during the period. Instead of the decelerated actual growth, a constant growth of 20 percent per annum was used from 1990 to 1993. Furthermore, as a result of a relaxed monetary policy, interest rate (RIA9) is set at relative lower rate, in fact, constant all through out the period at 17 percent. Thus, in this scenario, the value of MIRE9 is 18 percent higher than the baseline.

Scenario 7. This scenario is called *relaxed monetary with no cut in government spending*. This scenario attempts to analyze the impact of combining Scenarios 5 and 6.

Scenario 8. This scenario is called *aggressive tariff program with no exchange rate adjustment*. In terms of implicit tariff there is a big gap in the rates between the primary sector (agriculture and mining) and the manufacturing sector. For the manufacturing sector the rates range from 26.6 to 28.1 percent, while for the primary sector from 9 to 9.8 percent. Although the rates in 1992 are lower than in 1988, the decline is marginal. The gap in the rates between the two major sectors still prevails at present. The scenario attempts to analyze the effect of narrowing the gap in the implicit tariff rates between these two major sectors. Thus, from a gap of almost 3 times in 1988, the rates on the manufacturing sector were allowed to decrease, using a straight line method, until the gap almost vanishes in 1993. In 1993, the implicit tariff rates on the tradable sector are almost uniform at about 9 percent. The reduction in tariff rates under this scenario is not accompanied by a depreciation in the exchange rate.

Scenario 9. This scenario is called *aggressive tariff program with exchange rate adjustment as in Scenario 1*. This scenario attempts to analyze the impact of combining Scenarios 1 and 8.

Scenario 10. This scenario is called *aggressive tariff program with exchange rate adjustment as in Scenario 2*. This scenario attempts to analyze the impact of combining Scenarios 2 and 8.

IV.B. Simulation Results

The analysis of the simulation results is based on the baseline solution, i.e., percentage difference from the baseline solution. The discussion will focus on the macroeconomic impact of the different scenarios, (i.e., impact on GDP, prices, sectoral production, fiscal balance, and trade balance) and on factor payments and income distribution.

Macroeconomic Impact

Table 6a shows the results of both real GDP and CPI of the 10 scenarios. Note that these numbers have been adjusted to the actual data⁷. Thus the baseline results are actual data on both real GDP and CPI (except that the CPI was rebased to 1987).

⁷The adjustment was made by getting the difference between the actual data and the baselineresults to come up with the annual adjustment factors. These adjustment factors were then uniformly applied to the results of the 10 scenarios.

Table 6b shows the percentage difference of both real GDP and CPI from the baseline. The table also shows both the cumulative percentage difference and the annual average percentage difference within the simulation period, 1987 to 1993.

One would note that of the 10 scenarios conducted, the scenarios which involve exchange rate adjustments have the biggest positive impact in terms of real GDP. These scenarios are 1, 2, 9, and 10. As discussed in the model, the exchange rate plays a major role not only in the real sector, but also in the financial sector.

There are two sets of scenarios which involve exchange rate adjustments: one with aggressive tariff program (9 and 10) and another set, without (1 and 2). In comparing these two sets of scenarios, one would observe that the ones with a "aggressive" tariff program resulted in the highest positive impact on real GDP.

It is interesting to note that in the scenarios which involve both fiscal and monetary adjustments (3, 4, 5, 6, and 7) during the early 1990s, the impact on real GDP is generally lower than those with exchange rate adjustments.

What are the effects on prices? The most evident result is that an "aggressive" exchange rate adjustment is inflationary. This is understandable because the economy heavily depends on imported raw materials, which is adequately captured by the model.⁸ Thus significant changes in the exchange rate could indeed translate to significant increases in prices. However, it may not be stagflationary⁹. We have seen above that the impact on growth is also substantial. In Scenarios 2 and 10, the impact on CPI and GDP is the highest.

The impact of a relaxed monetary policy, together with fiscal budget cutting, on prices is the highest. In terms of growth, it is also the lowest. Clearly, it is stagflationary. Even if a relaxed monetary policy is accommodated by a higher fiscal spending, at least during the early 1990s, the impact on prices is also high (Scenario 7). These results imply that the impact of the aggregate demand reduction program in the early 1990s through tight money and fiscal restraint was more on price reduction than on real output contraction.¹⁰

Another interesting result is shown in Scenario 9. It is important to emphasize that this scenario involves a constant real exchange rate and an aggressive tariff program. The incremental effect on real GDP is 2 percent per year on the average. The effect on the CPI is much lower, 1.19 percent per year on the average. This is the scenario where the gap between the impact on real GDP and CPI is the highest, in favor of real GDP.

⁸The model does not allow for any substitution possibility between imported and domestically produced inputs. This is shown in the fixed coefficient between output of the manufacturing sector and imported inputs.

⁹Other studies have shown stagflationary effect of exchange rate adjustments, particularly depreciation (literature to be supplied later).

¹⁰This results can be explained by the fact that, given a constant import capacity, the increase in money supply does not shift the aggregate supply, but instead shifts the aggregate demand outwards, giving a lot of pressure on prices. Thus, the price effect is a lot higher than the output effect.

However, a peso real appreciation results in substantially lower output growth. Moreover, a real peso appreciation together with a marginal reduction in tariff has an even lower output effect. This would therefore imply that the actual real appreciation of the peso together and the slow tariff reduction program during the period entailed a substantial output cost.

Tables 7a and 7b show the impact of the different scenarios on sectoral GDP.

What are the effects on the fiscal balance? Table 8 shows the ratio between the budget balance of the national government and GDP. These ratios have also been adjusted to the actual data. The average budget balance to GDP ratio in the period 1987 to 1993 is about -2.4 percent. The ratio was increasing towards the 1990s, but decreasing thereafter.

The simulation results show that a depreciation of the exchange rate does not lead to a widening of the fiscal deficit-to-GDP ratio. In fact, the ratio is smaller with depreciation. This is so because the output effect of the depreciation is significant. Therefore, the fiscal revenue effect is also significant.¹¹

What about the impact on the trade balance? Table 9a and 9b show the ratio of the trade gap to GDP. Trade gap here is defined as the difference between exports and import of merchandise trade and non-factor services in the national income accounts. The results have also been adjusted to the actual data. Thus, the ratios for the baseline are actual data. In the period 1987 to 1993, the trade gap to GDP ratio was -5.04 percent on the average.

Scenario 1 which involves a constant exchange rate results in higher exports by about 1.26 percent on the average from the baseline. Imports also improve, but at a lower rate of 0.89 percent from the baseline. Thus the trade gap to GDP ratio is lower than the baseline, being -4.90 percent on the average within the period as compared to -5.04 percent for the baseline.

In the case of Scenario 2, an aggressive exchange rate policy results in a much higher imports than exports. Total exports is about 2.05 percent above the baseline, but total imports is 3.53 percent above the baseline. These results seem to be counterintuitive: an aggressive exchange rate policy (i.e., significant depreciation) should have a dampening effect on imports because the depreciation increases the domestic price of imports. However, if one recalls the output effect of an exchange rate depreciation (which is significant) one concludes that the output effect is much higher than the price effect. Since the economy is highly dependent on imported raw materials, the higher output effect therefore leads to a higher demand for imports. Therefore, with imports growing faster than exports under this scenario, the trade deficit ratio increases slightly to -5.55 percent.

Table 10a shows the effects on factor payments and income distribution, while Table 10b shows the percentage difference of these from the baseline.

¹¹ In the debt overhang issue, it has been argued that an exchange rate depreciation results in a widening of the fiscal deficit because a significant part of the budget is allocated to debt servicing. The results show that this effect does not hold, essentially because the output effect of an exchange rate depreciation is significant.

There are three factors of production included in the model: labor, unincorporated capital, and corporate capital. There are also three household types: Metro Manila, urban, and rural.

The impact of the scenarios on income is not as clear as the impact on macroeconomic variables. The income distribution effects cannot be adequately analyzed here because the household groupings in the model is very limited. A richer analysis can probably be made in the updated version of the model.

Majority of the poor households are located in the rural areas. However, the results show that rural households seem to benefit under Scenarios 1, 2, 9, and 10. Their share in the income pie increase under these scenarios, although marginally. Again, these scenarios involve exchange rate adjustments. However, it is not very clear what causes this improvement. In scenarios 1 and 2, this is due to the improvement in the factor payment to unincorporated capital, which is mostly mixed income or income from the informal sector. Under the two scenarios, unincorporated capital factor payment increase its share (note that capital factor payment also increase, which really adds to the puzzle). Under Scenario 9, the marginal increase seems to be due to the increase in labor factor payment. Under Scenario 10, it is partly again due to the increase in unincorporated capital factor payment, again marginally.

Preliminary Remarks

These results are preliminary. The original JV model will still have to be updated to account for the recent changes in the SAM and the parameter estimates of the model. However, the direction of the results of the present simulations give generally interesting policy insights. The stabilization program implemented in the early 1990s seems to generate favorable results. It looks like the impact of the tight monetary policy and the budget cutting on output growth is minimal, but the effects on prices is significant. However, the structural adjustments are far from satisfactory. This is clearly shown in the real appreciation of the peso and the marginal reduction in tariff protection. The output growth impact of these developments is significant.

The negative impact of an exchange rate depreciation on the budget deficit is found to be insignificant in the simulation. Even if the depreciation is accompanied by a tariff reduction, the resulting fiscal gap is not very far from the baseline. This is contrary to the generally held view on the issue of debt overhang that an exchange rate depreciation widens the fiscal gap because of the fact that a significant portion of the government budget is for debt servicing. The results show that the output effect and the revenue effect of these policy changes surpass the increase in government spending.

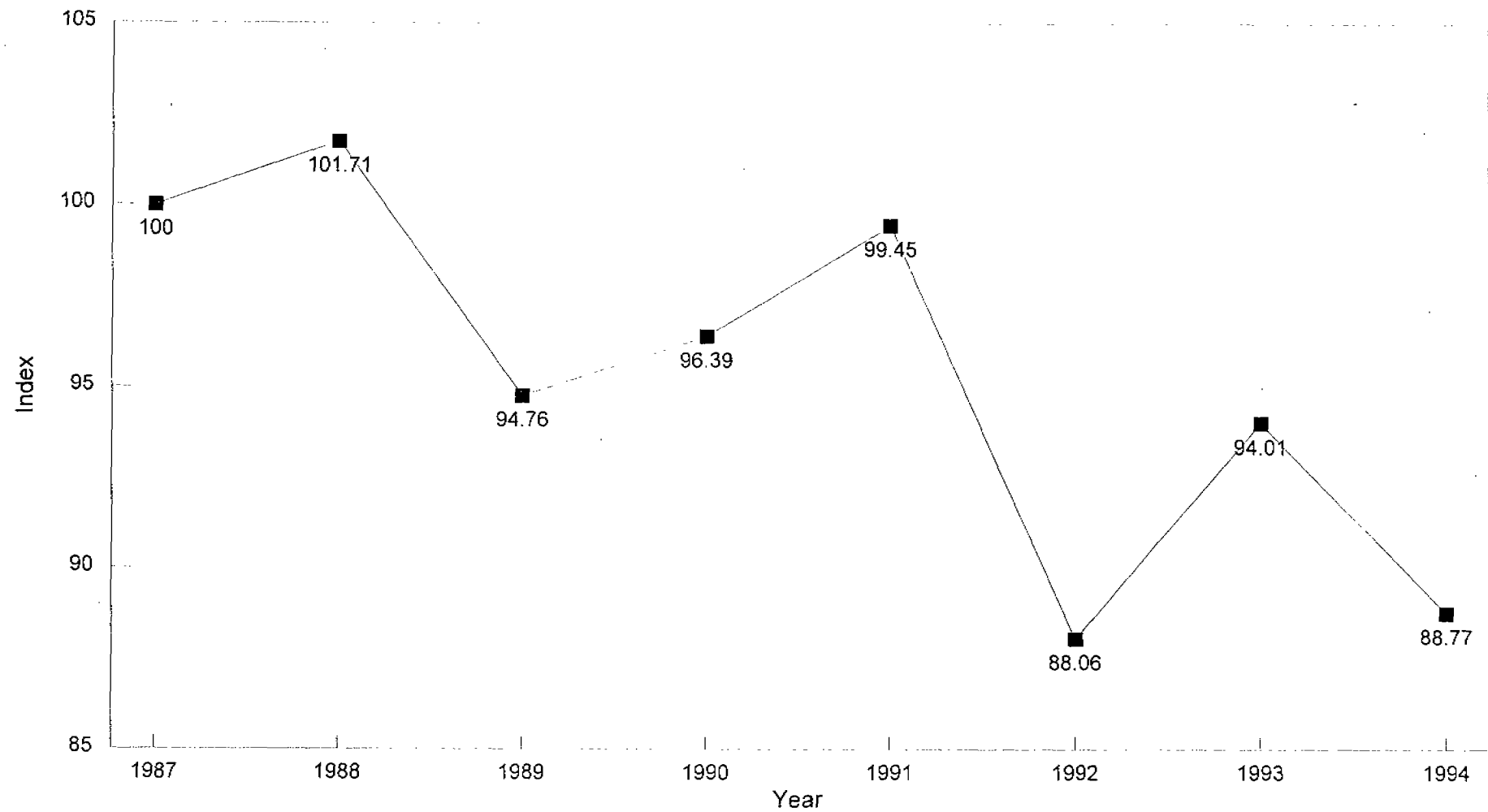
The effects on income distribution are not very clear. However, there are indications, though very vague at the moment, that the rural sectors would seem to benefit under scenarios where the exchange rate is allowed to depreciate.¹²

¹²This preliminary finding is generally consistent with my other simulation results using a different CGE model. (Cororaton, 1995).

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Figure 1: Real Exchange Rate Index



Source: Table 2

Table 1
Sectors in the Jemio and Vos Model

Production Sector

- 1) Agriculture
- 2) Mining
- 3) Light Manufacturing
- 4) Other Manufacturing
- 5) Construction & Utilities
- 6) Services

Institution

Non - Financial

- 1) Households
- 2) Private Corporation
- 3) Public Corporation
- 4) Government

Financial

- 1) Central Bank
- 2) Public Financial Institution
- 3) Private Financial Institution

Households

- 1) Metro Manila
- 2) Other Urban
- 3) Rural

Assets

Physical Capital

- 1) Unincorporated capital
- 2) Corporate capital

Financial Assets

- 1) Money
- 2) Government securities
- 3) Deposits
- 4) Foreign Exchange

Table 2
Values of Variables Used in Computing for Baseline Solution

I. Various Variables							
	1987	1988	1989	1990	1991	1992	1993
ER9	1.000	1.017	0.948	0.964	0.995	0.880	0.940
RIW9	0.060	0.060	0.060	0.066	0.074	0.074	0.074
RIA9	0.170	0.205	0.260	0.326	0.297	0.224	0.173
GVCO9	26.55	28.96	30.98	33.08	32.37	32.09	34.07
NFP9	23.74	24.25	28.46	31.88	40.59	60.00	55.87
INVGA9	1.27	1.56	1.80	2.79	1.93	2.18	2.52
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
where:							
ER9:	Real Exchange rate index						
RIW9:	International interest rate						
RIA9:	Domestic administered interest rate						
GVCO9:	Real government consumption						
NFP9:	Net factor income from abroad						
INVGA9:	Real government construction						
MIRES9:	Minimum level of exchange reserves						

II. Terms of Trade							
	1987	1988	1989	1990	1991	1992	1993
Agriculture	1.00	1.11	1.03	0.92	0.98	0.95	0.94
Mining	1.00	1.11	1.03	0.92	0.98	0.95	0.94
Light Mfg	1.00	1.11	1.03	0.92	0.98	0.95	0.94
Other Mfg	1.00	1.11	1.03	0.92	0.98	0.95	0.94
Construction & Utilities	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Services	1.00	1.00	1.00	1.00	1.00	1.00	1.00

III. Change in External Debt Over Time							
	1987	1988	1989	1990	1991	1992	1993
Households	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Corporate Enterprises	-5.30	-10.70	-2.00	3.40	-1.50	12.30	4.30
State Enterprises	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Government	11.40	1.70	1.00	3.50	7.90	17.40	17.10
Central Bank	-13.00	-6.70	-14.50	1.00	-3.10	-59.80	11.90
Government Banks	-1.40	-0.20	0.30	0.40	-0.90	0.40	0.40
Private Banks	3.70	-5.20	9.00	-24.40	9.60	-37.40	-98.00

IV. Debt Relief							
	1987	1988	1989	1990	1991	1992	1993
	0.072	0.073	0.223	0.819	0.264	0.696	0.097

V. Tariff Rates							
	1987	1988	1989	1990	1991	1992	1993
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.09	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.276	0.271	0.267	0.262	0.257
Other Mfg	0.278	0.266	0.253	0.241	0.228	0.216	0.203
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VI. Current Transfers to Institutions from the Rest of the World							
	1987	1988	1989	1990	1991	1992	1993
	7.359	9.9	10.6	9.2	10.6	10.3	10

Table 3
Foreign Exchange Rate

	1987	1988	1989	1990	1991	1992	1993	1994
<i>Philippine peso to US dollar</i>								
Forex (P/US\$)	20.57	21.09	21.74	24.32	27.48	25.51	27.12	26.42
Currency depreciation	0.9	2.5	3.1	11.9	13.0	-7.2	6.3	-2.6
RP Inflation	3.8	8.8	10.6	12.6	17.7	8.9	7.6	9.0
US Inflation	3.7	4.0	4.8	5.4	4.3	3.0	3.0	2.6
Real Currency depreciation	0.8	-2.3	-2.7	4.6	-0.4	-13.1	1.7	-9.0
<i>Philippine peso to Japanese yen</i>								
Forex (P/Y)	0.14	0.16	0.16	0.17	0.21	0.20	0.25	0.26
Currency depreciation		15.6	-4.1	7.2	22.5	-1.5	19.9	7.6
RP Inflation	3.8	8.8	10.6	12.6	17.7	8.9	7.6	9.0
Japanese Inflation		0.7	2.2	3.1	3.3	1.2	1.2	0.2
Real Currency depreciation		7.6	-12.5	-2.3	8.1	-9.3	13.6	-1.2
Weighted real foreign exchange change		1.7	-6.8	1.7	3.2	-11.5	6.8	-5.6

Table 4
Parameter and Elasticity Specification

Production, Technology and Factor Incomes							
		AG	MN	ML	MO	CT	SR
Indirect tax rates	(tx_i)	0.04	0.10	0.05	0.12	0.03	0.05
Capital-Labour Substitution	(ρ_i)	0.50	0.50				
Distributive shares of capital in total output:							
corporate capital	$(\beta_{CP,i})$	0.02	0.37	0.01	0.11	0.27	0.09
unincorporated capital	$(\beta_{UP,i})$	0.46	0.06	0.19	0.06	0.05	0.34
Labour-output coefficients	(β_i)	0.23	0.16	0.16	0.12	0.19	0.20
Labour Market							
Labour-force growth	(n)	0.025					
Wage indexation function:							
price adjustment	(cw_1)	0.23					
unemployment	(cw_2)	0.21					
lagged effect	(cw_3)	0.50					
Foreign Trade							
		AG	MN	ML	MO	CT	SR
Price elasticity of export demand	(c_i)	0.20	0.20	0.75	0.75	0.20	0.20
Price elasticity of import demand							
intermediate goods	(ρ_i)	0.50	0.50	0.00	0.00	0.00	0.00
consumer goods		implicit in LES function					
capital goods		zero					
Households							
		Metro Manila (HM)		Other Urban (HU)		Rural (HR)	
Marginal savings rates:							
income	(λ_1)	0.269		0.304		0.231	
wealth	(λ_2)	-0.013		-0.016		-0.006	
Direct tax rates	(txd_h)	0.044		0.039		0.017	

Portfolio demand	$(\sigma_{h, k})$	0.25 - 0.35	0.25 - 0.35	0.25 - 0.35
Corporate Firms				
		Private (CE)	State (SE)	
Direct tax rate	(txd_k)	0.38	0.01	
Investment demand:				
lag effect	(χ_1)	0.88		
accelerator	(χ_2)	0.15		
Portfolio demand	$(\sigma_{k, k})$	0.25 - 0.35	0.25 - 0.35	
Government				
Investment demand				
foreign fin. effect	(u)	0.70		
Portfolio demand	$(\sigma_{GV, k})$	0.25 -0.35		

Table 5
Definition of Scenario Runs

Scenario 1: Constant Exchange Rate							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
ER9	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MIRES9	35.00	42.81	54.79	66.75	76.05	84.49	97.74
Baseline:							
ER9	1.00	1.02	0.95	0.96	1.00	0.88	0.94
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
Note: All other variables same as in baseline							
Scenario 2: Aggressive Exchange Rate							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
ER9	1.00	1.02	1.02	1.03	1.07	1.07	1.14
MIRES9	35.00	43.53	55.72	69.04	81.17	90.19	111.42
Baseline:							
ER9	1.00	1.02	0.95	0.96	1.00	0.88	0.94
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
Note: All other variables same as in baseline							
Scenario 3: No Cut in Government Consumption							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
GVC09	26.55	28.96	30.98	33.08	35.06	37.16	39.45
Baseline:							
GVC09	26.55	28.96	30.98	33.08	32.37	32.09	34.07
Note: All other variables same as in baseline							
Scenario 4: No Cut in Government Construction							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
INVGA9	1.27	1.56	1.80	2.79	3.35	3.80	4.38
Baseline:							
INVGA9	1.27	1.56	1.8	2.79	1.93	2.18	2.52
Note: All other variables same as in baseline							
Scenario 5: No Cut in Government Consumption and Construction							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
GVC09	26.55	28.96	30.98	33.08	35.06	37.16	39.45
INVGA9	1.27	1.56	1.80	2.79	3.35	3.80	4.38
Baseline:							
GVC09	26.55	28.96	30.98	33.08	32.37	32.09	34.07
INVGA9	1.27	1.56	1.8	2.79	1.93	2.18	2.52
Note: All other variables same as in baseline							

Table 5
Definition of Scenario Runs

Scenario 6: Relaxed Monetary							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
MIRES	35.00	43.53	51.93	64.34	79.68	84.62	108.45
RIA9	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Baseline:							
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
RIA9	0.17	0.20	0.26	0.33	0.30	0.22	0.17
<i>Note: All other variables same as in baseline</i>							

Scenario 7: Relaxed Monetary, with No Cut In Government Spending							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
GVC09	26.55	28.96	30.98	33.08	35.06	37.16	39.45
INVGA9	1.27	1.56	1.80	2.79	3.35	3.80	4.38
MIRE5	35.00	43.53	51.93	64.34	79.68	84.62	108.45
RIA9	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Baseline:							
GVC09	26.55	28.96	30.98	33.08	32.37	32.09	34.07
INVGA9	1.27	1.56	1.8	2.79	1.93	2.18	2.52
MIRE59	35.00	43.53	51.93	64.34	75.65	74.39	91.90
RIA9	0.17	0.20	0.26	0.33	0.30	0.22	0.17
<i>Note: All other variables same as in baseline</i>							

Scenario 8: Aggressive Tariff Program with No Exchange Rate Adjustment							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.243	0.205	0.168	0.130	0.092
Other Mfg	0.278	0.266	0.232	0.198	0.164	0.130	0.096
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Baseline:							
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.276	0.271	0.267	0.262	0.257
Other Mfg	0.278	0.266	0.253	0.241	0.228	0.216	0.203
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<i>Note: All other variables same as in baseline</i>							

Table 5
Definition of Scenario Runs

Scenario 9: Aggressive Tariff Program with Exchange Rate Adjustment as in Scenario 1							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
ER9	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MIRES	35.00	42.81	54.79	66.75	76.05	84.49	97.74
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.243	0.205	0.168	0.130	0.092
Other Mfg	0.278	0.266	0.232	0.198	0.164	0.130	0.096
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Baseline:							
ER9	1.00	1.02	0.95	0.96	1.00	0.88	0.94
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.276	0.271	0.267	0.262	0.257
Other Mfg	0.278	0.266	0.253	0.241	0.228	0.216	0.203
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All other variables same as in baseline

Scenario 10: Aggressive Tariff Program with Exchange Rate Adjustment as in Scenario 2							
	1987	1988	1989	1990	1991	1992	1993
Scenario:							
ER9	1.00	1.02	1.02	1.03	1.07	1.07	1.14
MIRES	35.00	43.53	55.72	69.04	81.17	90.19	111.42
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.243	0.205	0.168	0.130	0.092
Other Mfg	0.278	0.266	0.232	0.198	0.164	0.130	0.096
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Baseline:							
ER9	1.00	1.02	0.95	0.96	1.00	0.88	0.94
MIRES9	35.00	43.53	51.93	64.34	75.65	74.39	91.90
Agriculture	0.099	0.098	0.097	0.097	0.096	0.095	0.094
Mining	0.092	0.090	0.089	0.087	0.085	0.084	0.082
Light Mfg	0.286	0.281	0.276	0.271	0.267	0.262	0.257
Other Mfg	0.278	0.266	0.253	0.241	0.228	0.216	0.203
Construction & Utilities	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Services	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: All other variables same as in baseline

Table 6a
Real GDP and CPI Results

	1987	1988	1989	1990	1991	1992	1993
GDP *							
Baseline	617	659	699	721	717	719	734
Scenario 1	617	654	713	728	716	744	744
Scenario 2	617	659	717	735	732	765	780
Scenario 3	617	659	699	721	719	728	740
Scenario 4	617	659	699	721	717	725	737
Scenario 5	617	659	699	721	720	729	741
Scenario 6	617	659	701	731	732	709	720
Scenario 7	617	659	701	731	736	726	737
Scenario 8	617	659	703	727	725	729	747
Scenario 9	617	654	716	734	725	761	761
Scenario 10	617	659	720	742	741	777	796
CPI *							
Baseline	100.00	108.93	122.22	139.54	165.58	180.39	194.12
Scenario 1	100.00	106.91	126.26	141.56	164.57	186.45	195.13
Scenario 2	100.00	108.93	127.27	143.58	168.61	191.50	204.22
Scenario 3	100.00	108.93	122.22	139.54	166.59	187.46	198.16
Scenario 4	100.00	108.93	122.22	139.54	165.58	185.44	197.15
Scenario 5	100.00	108.93	122.22	139.54	166.59	187.46	198.16
Scenario 6	100.00	108.93	124.24	145.60	172.65	192.51	201.19
Scenario 7	100.00	108.93	124.24	145.60	173.66	187.46	198.16
Scenario 8	100.00	108.93	122.22	139.54	165.58	180.39	194.12
Scenario 9	100.00	106.91	126.26	141.56	164.57	188.47	197.15
Scenario 10	100.00	108.93	127.27	143.58	169.62	192.51	204.22

* Adjusted to actual values.

Table 6b
Real GDP and CPI, Percent Difference from Baseline

	1987	1988	1989	1990	1991	1992	1993	cumulative	average
GDP									
Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scenario 1	0.00	-0.66	1.93	0.97	-0.11	3.49	1.35	6.97	1.00
Scenario 2	0.00	0.00	2.53	2.02	2.13	6.34	6.21	19.23	2.75
Scenario 3	0.00	0.00	-0.00	0.00	0.28	1.30	0.73	2.31	0.33
Scenario 4	0.00	0.00	-0.00	0.00	0.14	0.80	0.33	1.26	0.18
Scenario 5	0.00	0.00	-0.00	0.00	0.42	1.47	0.95	2.84	0.41
Scenario 6	0.00	0.05	0.23	1.49	2.16	-1.37	-2.00	0.56	0.08
Scenario 7	0.00	0.05	0.23	1.49	2.74	0.98	0.40	5.89	0.84
Scenario 8	0.00	0.00	0.46	0.91	1.21	1.43	1.75	5.75	0.82
Scenario 9	0.00	-0.66	2.39	1.90	1.16	5.82	3.60	14.22	2.03
Scenario 10	0.00	0.00	2.99	2.96	3.44	8.06	8.37	25.83	3.69
CPI									
Baseline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scenario 1	0.00	-1.85	3.31	1.45	-0.61	3.36	0.52	6.17	0.88
Scenario 2	0.00	0.00	4.13	2.90	1.83	6.16	5.20	20.22	2.89
Scenario 3	0.00	0.00	0.00	0.00	0.61	3.92	2.08	6.61	0.94
Scenario 4	0.00	0.00	0.00	0.00	0.00	2.80	1.56	4.36	0.62
Scenario 5	0.00	0.00	0.00	0.00	0.61	3.92	2.08	6.61	0.94
Scenario 6	0.00	0.00	1.65	4.34	4.27	6.72	3.64	20.63	2.95
Scenario 7	0.00	0.00	1.65	4.34	4.88	3.92	2.08	16.88	2.41
Scenario 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scenario 9	0.00	-1.85	3.31	1.45	-0.61	4.48	1.56	8.33	1.19
Scenario 10	0.00	0.00	4.13	2.90	2.44	6.72	5.20	21.39	3.06

Table 7
GDP by Activity
Percent Difference from Baseline

	1987	1988	1989	1990	1991	1992	1993	Cumulative	Average
SC1: Constant Exchange Rate									
AG	0.00	-0.39	1.00	1.01	0.50	2.45	1.70	6.28	0.90
MN	0.00	-0.60	1.67	2.80	1.86	8.99	7.09	21.80	3.11
MFG	0.00	-0.62	1.66	1.00	0.23	4.06	2.19	8.51	1.22
CT	0.00	-3.19	10.51	2.17	-5.78	9.29	-5.97	7.03	1.00
SR	0.00	-0.57	1.58	0.75	-0.05	3.04	1.44	6.20	0.89
SC2: Aggressive Exchange Rate Policy									
AG	0.00	0.00	1.49	1.88	2.12	4.87	6.06	16.43	2.35
MN	0.00	0.00	2.55	4.87	5.48	11.75	14.43	39.08	5.58
MFG	0.00	-0.01	2.23	2.03	2.29	6.35	6.77	19.67	2.81
CT	0.00	0.03	12.64	5.69	4.96	24.46	12.60	60.37	8.62
SR	0.00	-0.00	2.06	1.61	1.73	5.18	5.29	15.86	2.27
SC3: No Reduction in Government Consumption									
AG	0.00	0.00	0.00	0.00	-0.02	0.46	1.73	2.18	0.31
MN	0.00	0.00	0.00	0.00	-1.11	-9.85	-5.53	-16.50	-2.36
MFG	0.00	-0.01	-0.01	0.00	-0.13	-1.08	-0.84	-2.07	-0.30
CT	0.00	0.03	0.00	0.05	1.22	24.16	7.46	32.91	4.70
SR	0.00	-0.00	-0.00	0.00	0.64	0.94	0.56	2.14	0.31
SC4: No Reduction in Government Construction									
AG	0.00	0.00	0.00	0.00	-0.01	0.39	1.47	1.84	0.26
MN	0.00	0.00	0.00	0.00	-0.37	-7.35	-3.72	-11.43	-1.63
MFG	0.00	-0.01	-0.01	0.00	0.00	-0.87	-0.66	-1.56	-0.22
CT	0.00	0.03	0.00	0.05	2.44	22.50	8.89	33.91	4.84
SR	0.00	-0.00	-0.00	0.00	0.06	-0.20	-0.58	-0.73	-0.10
SC5: No Reduction in Government Consumption and Construction									
AG	0.00	0.00	0.00	0.00	-0.04	0.48	1.74	2.19	0.31
MFG	0.00	0.00	0.00	0.00	-1.49	-9.77	-5.53	-16.78	-2.40
MO	0.00	-0.01	-0.01	0.00	-0.11	-0.99	-0.75	-1.88	-0.27
CT	0.00	0.03	0.00	0.05	3.71	26.06	10.12	39.97	5.71
SR	0.00	-0.00	-0.00	0.00	0.70	1.05	0.69	2.44	0.35

Table 7
GDP by Activity
Percent Difference from Baseline

	1987	1988	1989	1990	1991	1992	1993	Cumulative Average	
SC6: Relaxed Monetary Policy									
AG	0.00	0.00	0.30	1.37	3.04	1.96	3.47	10.14	1.45
MN	0.00	-1.03	-2.99	-7.03	-7.15	-20.57	-12.70	-51.47	-7.35
MFG	0.00	-0.32	-0.68	-0.36	-0.01	-4.54	-3.83	-9.73	-1.39
CT	0.00	3.76	7.67	21.19	25.22	24.76	0.23	82.85	11.84
SR	0.00	-0.08	-0.14	0.37	0.79	-3.73	-3.86	-6.65	-0.95
SC7: Relaxed Monetary Policy Together with No Contraction in Government Spending									
AG	0.00	0.00	0.30	1.37	3.09	3.16	3.41	11.33	1.62
MN	0.00	-1.03	-2.99	-7.03	-8.73	-8.82	-6.05	-34.64	-4.95
MFG	0.00	-0.32	-0.68	-0.36	0.03	-1.22	-1.20	-3.75	-0.54
CT	0.00	3.76	7.67	21.19	29.56	10.87	-0.03	73.02	10.43
SR	0.00	-0.08	-0.14	0.37	1.64	0.38	0.03	2.20	0.31
SC8: Aggressive Tariff without Adjustments in the Exchange Rate									
AG	0.00	0.00	0.26	0.63	0.81	1.03	1.15	3.88	0.55
MN	0.00	0.00	0.26	1.17	1.21	2.59	2.59	7.83	1.12
MFG	0.00	0.00	0.44	0.94	1.24	1.70	2.01	6.33	0.90
CT	0.00	0.00	1.63	1.72	3.26	1.05	2.56	10.21	1.46
SR	0.00	0.00	0.45	0.97	1.25	1.57	1.91	6.14	0.88
SC9: Agressive Tariff with Adjustment in the Exchange Rate (same as in SC1)									
AG	0.00	-0.39	1.25	1.65	1.34	3.99	4.08	11.92	1.70
MN	0.00	-0.60	1.84	3.88	3.25	7.95	7.86	24.19	3.46
MFG	0.00	-0.62	2.09	1.97	1.52	5.69	4.15	14.79	2.11
CT	0.00	-3.19	12.16	3.99	-2.35	24.27	2.06	36.94	5.28
SR	0.00	-0.57	2.04	1.74	1.26	5.00	3.31	12.76	1.82
SC10: Agressive Tariff with Adjustment in the Exchange Rate (same as in SC2)									
AG	0.00	0.00	1.74	2.52	2.98	6.06	7.66	20.96	2.99
MN	0.00	0.00	2.81	5.95	6.78	13.31	16.51	45.35	6.48
MFG	0.00	-0.01	2.67	3.01	3.63	8.16	9.12	26.58	3.80
CT	0.00	0.03	14.32	7.57	8.64	29.18	17.86	77.61	11.09
SR	0.00	-0.00	2.52	2.61	3.07	6.90	7.41	22.50	3.21

where:

AG Agriculture
MN Mining
MFG Manufacturing
CT Construction
SR Services

Table 8
Fiscal Gap Ratio*

	1987	1988	1989	1990	1991	1992	1993	Average
Baseline	-2.44	-2.82	-2.38	-3.60	-2.09	-1.59	-1.61	-2.36
Scenario 1	-2.44	-3.20	-1.37	-3.10	-2.19	-0.05	-1.10	-1.92
Scenario 2	-2.44	-2.90	-1.15	-2.74	-1.34	0.88	0.51	-1.31
Scenario 3	-2.44	-2.90	-2.12	-3.45	-2.48	-1.35	-2.02	-2.39
Scenario 4	-2.44	-2.90	-2.12	-3.45	-2.07	-0.70	-1.25	-2.13
Scenario 5	-2.44	-2.90	-2.12	-3.45	-2.43	-1.32	-1.96	-2.38
Scenario 6	-2.44	-2.83	-1.94	-2.88	-1.32	-0.72	-1.53	-1.95
Scenario 7	-2.44	-2.83	-1.94	-2.88	-1.62	-1.60	-2.20	-2.21
Scenario 8	-2.44	-2.90	-2.17	-3.57	-2.36	-1.53	-1.95	-2.42
Scenario 9	-2.44	-3.20	-1.43	-3.22	-2.43	-0.14	-1.44	-2.04
Scenario 10	-2.44	-2.90	-1.22	-2.87	-1.62	0.49	-0.03	-1.51

* (revenue - expenditure)/GDP of the national government

Table 9a
Trade Gap Ratio *

	1987	1988	1989	1990	1991	1992	1993	Average
Baseline	-0.97	-2.41	-4.39	-7.11	-4.83	-6.32	-9.24	-5.04
Scenario 1	-0.97	-2.18	-5.18	-7.21	-4.05	-6.37	-8.34	-4.90
Scenario 2	-0.97	-2.42	-5.32	-7.35	-4.66	-8.24	-9.88	-5.55
Scenario 3	-0.97	-2.42	-4.40	-7.12	-5.11	-9.33	-10.03	-5.63
Scenario 4	-0.97	-2.42	-4.40	-7.12	-4.96	-8.82	-9.79	-5.50
Scenario 5	-0.97	-2.42	-4.40	-7.12	-5.23	-9.40	-10.17	-5.67
Scenario 6	-0.97	-2.85	-5.50	-10.03	-7.75	-5.90	-5.70	-5.53
Scenario 7	-0.97	-2.85	-5.50	-10.03	-8.20	-6.40	-7.10	-5.86
Scenario 8	-0.97	-2.41	-4.75	-7.64	-5.79	-7.14	-10.72	-5.63
Scenario 9	-0.97	-2.18	-5.55	-7.75	-5.01	-9.54	-10.71	-5.96
Scenario 10	-0.97	-2.42	-5.69	-7.90	-5.66	-9.71	-11.82	-6.31

* (exports-imports)/GDP of merchandise trade and non-factor services in the national income accounts

Table 9b
Exports and Imports*
Percent Difference from Baseline

	1987	1988	1989	1990	1991	1992	1993	Cum.	Average
Baseline	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Scenario 1	0.00 0.00	-0.39 -1.12	0.80 3.24	0.96 1.22	0.70 -1.52	3.89 3.95	2.84 0.45	8.81 6.23	1.26 0.89
Scenario 2	0.00 0.00	-0.01 0.01	1.20 4.09	1.74 2.42	1.95 1.51	4.37 9.79	5.12 6.88	14.38 24.71	2.05 3.53
Scenario3	0.00 0.00	-0.01 0.01	-0.01 0.00	-0.00 0.01	-0.53 0.32	-4.43 4.11	-2.87 -0.30	-7.86 4.15	-1.12 0.59
Scenario 4	0.00 0.00	-0.01 0.01	-0.01 0.00	-0.00 0.01	-0.20 0.17	-3.48 3.51	-2.18 -0.39	-5.87 3.31	-0.84 0.47
Scenario 5	0.00 0.00	-0.01 0.01	-0.01 0.00	-0.00 0.01	-0.73 0.52	-4.49 4.26	-2.98 -0.04	-8.22 4.76	-1.17 0.68
Scenario 6	0.00 0.00	-0.83 0.60	-1.97 1.48	-4.04 4.90	-4.46 4.41	-8.71 -8.58	-5.95 -12.97	-25.96 -10.16	-3.71 -1.45
Scenario 7	0.00 0.00	-0.83 0.60	-1.97 1.48	-4.04 4.90	-5.13 5.19	-4.80 -3.69	-3.65 -7.67	-20.43 0.81	-2.92 0.12
Scenario 8	0.00 0.00	0.00 0.00	0.13 1.21	0.45 1.95	0.50 3.19	1.04 3.15	1.03 4.58	3.13 14.09	0.45 2.01
Scenario 9	0.00 0.00	-0.39 -1.12	0.93 4.50	1.42 3.24	1.22 1.69	3.04 12.03	2.66 6.32	8.88 26.67	1.27 3.81
Scenario 10	0.00 0.00	-0.01 0.01	1.32 5.36	2.20 4.50	2.48 4.91	5.06 14.69	6.00 12.83	17.06 42.31	2.44 6.04

* exports and imports of merchandise trade and non-factor services in the national income accounts

Table 10a
Factor Payments and Income Distribution

	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Income by Factor of Production											
LB	0.374	0.373	0.372	0.375	0.375	0.375	0.381	0.380	0.376	0.375	0.373
UP	0.478	0.479	0.479	0.477	0.477	0.477	0.471	0.473	0.477	0.477	0.478
CP	0.148	0.149	0.150	0.148	0.148	0.148	0.147	0.147	0.147	0.148	0.149
total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Gross Income by Household Category											
HH	0.247	0.247	0.247	0.248	0.247	0.248	0.249	0.249	0.247	0.247	0.247
HU	0.317	0.317	0.317	0.318	0.317	0.318	0.318	0.318	0.317	0.317	0.317
HR	0.435	0.436	0.436	0.435	0.435	0.435	0.434	0.434	0.435	0.435	0.436
total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Disposable Income by Household Category											
HH	0.244	0.244	0.244	0.244	0.244	0.244	0.246	0.245	0.244	0.244	0.244
HU	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315
HR	0.441	0.441	0.442	0.441	0.441	0.441	0.440	0.440	0.441	0.441	0.442
total	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

where:

Table 10b
Factor Payments and Income Distribution
(Percent Difference from Baseline)

	Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Income by Factor of Production											
LB	0.00	-0.48	-0.75	0.15	0.21	0.13	1.88	1.62	0.46	0.18	-0.23
UP	0.00	0.22	0.22	-0.13	-0.24	-0.16	-1.35	-1.07	-0.18	-0.09	0.01
CP	0.00	0.51	1.18	0.04	0.22	0.20	-0.39	-0.65	-0.58	-0.16	0.55
Gross Income by Household Category											
HH	0.00	-0.12	-0.18	0.17	0.08	0.17	0.59	0.55	0.01	-0.06	-0.15
HU	0.00	-0.01	-0.03	0.02	0.00	0.03	0.03	0.05	0.00	-0.01	-0.02
HR	0.00	0.08	0.12	-0.11	-0.05	-0.12	-0.36	-0.35	-0.01	0.04	0.10
Disposable Income by Household Category											
HH	0.00	-0.12	-0.18	0.17	0.09	0.17	0.60	0.56	0.01	-0.06	-0.16
HU	0.00	-0.02	-0.03	0.03	0.01	0.03	0.04	0.05	0.00	-0.01	-0.03
HR	0.00	0.08	0.12	-0.11	-0.05	-0.12	-0.36	-0.34	-0.01	0.04	0.11