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Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

## Trade Reforms, Unemployment, Household Income and Welfare: The Philippine Case

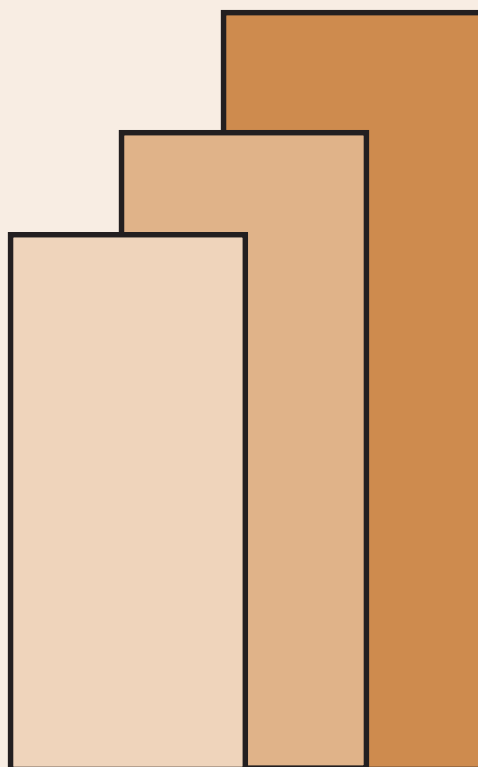
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# **Trade Reforms, Unemployment, Household Income and Welfare: The Philippine Case**

**Caesar B. Cororaton**

## **Abstract**

The paper analyzes the possible effects of tariff reduction in the 1990s on unemployment, household income and household welfare using a computable general equilibrium model calibrated to the 1994 social accounting matrix. The series of simulation experiments indicate that tariff reduction is welfare improving. The transmission channel is not so much through the improvement in household income, but through the reduction in domestic and consumer prices.

In terms of resource reallocation effects and factor movements, the non-food manufacturing sector benefits the most. As a result, unemployment in production labor declines while its wages improve. However, agriculture sector contracts which results in higher unemployment in the sector and lower agriculture wages.

**Keywords:** Computable General Equilibrium Model, Trade reforms, Unemployment, Welfare

## **Trade Reforms, Unemployment, Household Income and Welfare: The Philippine Case<sup>1</sup>**

**Caesar B. Cororaton<sup>2</sup>**

The Philippine government pursued major structural economic reforms in the last one and a half decades. One of the sectors where reforms were vigorously pursued is the foreign trade, in which policies of tariff reduction, simplification of tariff structure, and “tariffication” of quantitative restrictions were implemented. While some of these reforms were pursued unilaterally, others were done under various multilateral agreements such as the World Trade Organization (WTO), as well as regional agreements under the Association of Southeast Asian Nations (ASEAN) such as the ASEAN Free Trade Area (AFTA). The objective of the paper is to analyze the effects of trade reforms, particularly tariff reduction policy from 1994 to 2000, on unemployment, household income and welfare using a computable general equilibrium (CGE) model calibrated to Philippine data in 1994.

### **The Philippine Economy: Growth Performance and Basic Structure**

The last 35 years saw wide swings in Philippine economic growth trend. Growth was highest during the 1973-82 period under the military regime of the Marcos administration, averaging 5.5 percent per year (Table 1). This was not sustained, however, as dissatisfaction among Filipinos on the military rule mounted, which eventually led to a political uprising in the following period, 1983-85, which in turn triggered the political crisis that resulted in a severe economic crisis. The economy contracted by an average of -4.1 percent per year during the period 1983-85. Political as well as economic difficulties created the critical pressure to force the Marcos administration out of power in the early 1986, and gave way to the new Aquino government. In the following period, 1986-90, the economy bounced back with growth averaging 4.5 percent per annum under the new administration. However, towards the end of the Aquino administration political tug-of-war led to a series of military coup attempts. Although the attempts failed, they created political uncertainties and instability. This, together with the series of natural calamities and severe energy crisis, brought the economy to a halt in the 1991-93 period, contracting again by -0.1 percent per year during the period.

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<sup>1</sup>Funded by the International Development Research Center (IDRC) of Canada. The paper benefited greatly from the series of discussions with the CREFA group of Laval University, especially from the critical comments and suggestions of Bernard Decaluwe and Nabil Annabi. The remaining gaps in the analysis are the sole responsibility of the author.

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The leadership of the Ramos administration revived the economy with a growth averaging 4.9 percent per year from 1994 to 1997. However, the Asian financial crisis, the El Nino effects on agriculture production in 1998, and the political scandals that wrecked havoc to the Estrada administration took a heavy toll on the economy, with growth sliding to 3.5 percent per year in the 1998-2000 period.

The effects on the unemployment rate of the unstable economic growth are presented in Figure 1. The deep recession in the mid-1980s resulted in high unemployment of 11.1 percent in two succeeding periods, 1985 and 1986. It slightly improved under the two successive administrations of President Aquino and President Ramos, reaching a record low of 7.4 percent unemployment rate in 1996. However, the combined effects of the Asian financial crisis in 1997, the drought in 1998 and the scandals in the Estrada administration brought the unemployment rate back to double digit in 2000.

Indeed, the last 35 years was a period of boom and bust growth cycle. Growth could not be sustained for an extended period because of unstable political system and of weak and fragile economic fundamentals.

To address the various weaknesses in the economic fundamentals major economic policy reforms were implemented during the Aquino government. Structural reforms like trade liberalization, foreign exchange liberalization, investment reforms, banking reforms, privatization, among others, were implemented.

The implementation of the reforms intensified in the 1990s. In general, the reforms are continuously being pursued at present. However, pressures from various groups and sectors are starting to emerge and are gaining momentum, which resulted in some postponement of further policy implementation in few cases, and some policy reversals in limited instances.

Whether these reforms resulted in favorable changes in the economy remains to be carefully investigated, but noticeable changes in some trend are starting to show up especially in the foreign trade sector. From 13.6 percent export-to-GDP ratio in the 1967-72 period, the share increased to 45.8 percent in 1998-2000 (Table 1). Import-to-GDP ratio likewise increased from 17.4 percent to 43.2 percent over the same period. Behind this impressive trade sector performance is the phenomenal growth of the semi-conductor industry, which largely caters to the export market. To date, exports of semi-conductor account for more than 60 percent of total merchandise exports of the country. However, it is highly import-dependent, with extremely small value added<sup>3</sup>. Thus the rise of the export share goes hand-in-hand with the increase in the import share to GDP.

Apparent signs of structural weaknesses prevail in the local economy despite of the reforms, though. The share of the total industry in general and of the

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<sup>3</sup>Semi-conductor firms are located in special places like the export processing zones. The linkage with the rest of the domestic economy is generally thin because, normally the production in these firms involves assembly operations only.

manufacturing in particular stagnated in the last 35 years (Table 2). The share of total industry picked up from 31.7 percent in the 1967-72 period to 37.4 percent in 1983-85. It declined since then and continued the decent to 30.9 percent share in 1998-2000. Similar dismal record for the manufacturing sector is observed over the same period. The drop in the share of agriculture showed up in the increasing share of the service sector.

The employment share in the total industry and in the manufacturing sector stagnated as well over the same period. Employment share in the total industry is about 15 percent, while in manufacturing 10 percent (Table 3).

The contrasting performance of the foreign trade sector to that of the industrial sector in general and of the manufacturing sub-sector in particular in terms of output and employment generation in the midst of policy reforms indicates the absence of trickle down effects. Considering the fact that these policy reforms have been pursued for quite sometime, the lack of concrete trickle down effects strongly implies a high degree of duality between the local and foreign sectors.

Table 4 shows a detailed structure of production of the economy based on the 1994 Social Accounting Matrix (SAM), which was constructed for the analysis. Agriculture and service sectors have high value added content (71.4 percent and 63.3 percent, respectively) as compared to the industry (34.5 percent). Non-food manufacturing sector has the lowest ratio of 29.7 percent. However, in terms of contribution to the overall value added, it is the service sector that contributes the largest share of 48.5 percent.

In terms of the contribution to the overall value of output, industry is the largest contributor, with a share of 46.7 percent. Of this share 23 percent comes from the non-food manufacturing sector. Contribution coming from agriculture is the lowest at 14.3 percent. About 55.1 percent of the overall value added is payments to capital, while the remaining 44.9 percent payments to labor. Agriculture has the highest labor payment of 47.7 percent, while industry 40.6 percent.

The structure of merchandise exports and imports in US dollars are shown in Tables 5a and 5b, which contain official information from the balance of payments accounts. Table 5c, on the other hand, contains information on exports and imports (which include both merchandise and non-merchandise trade) in local currency from the 1994 Official Input-Output Table, which was utilized in the construction of the 1994 SAM.<sup>4</sup>

As mentioned earlier, one striking development in the 1990's was the phenomenal growth in semi-conductor exports. This is seen in the surge of the share of electrical and electrical equipment in Table 5a, which includes largely exports of semi-conductor. Its share increased from 24 percent in 1990 to 59.5 percent in 2000.

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<sup>4</sup>One should note that information from the balance of payments account contain only merchandise trade, while information from the Input-Output Table contain merchandise trade as well as non-merchandise trade.

Garments used to be a major export item before the 1990s. However, its share dropped significantly in the 1990s. Similar declining trend over the same period is observed in agriculture-based exports.

In terms of imports, Table 5b shows a significant rise in the share of capital goods, from 25.6 percent in 1990 to 40 percent in 2000. The rest of the imports do not show any recognizable trend over the same period.

Table 5c presents the structure of sectoral exports and imports (which include merchandise and non-merchandise trade). One important item that needs to be highlighted is the significant share of non-food manufacturing in the total imports and exports. In 1994, its import share was 76.1 percent, while its export share was 48.2 percent. These commanding shares are largely attributed to the phenomenal rise in activities in the semi-conductor industry.

### **Trade Reforms**

The trade reform program has three major components: the 1981-1985 Tariff Reform Program (TRP); the Import Liberalization Program (ILP); and the complimentary realignment of the indirect taxes. In TRP, there was a narrowing of the tariff rate structure from a range of 100-0 percent to 50-10 percent. During the period 1983-1985 sales taxes on imports and locally produced goods were equalized. Also, the mark-up applied on the value of imports (for sales tax valuation) was reduced and eventually eliminated.

However, because of the balance of payments, economic, and political crises during the mid-1980s the import liberalization program was suspended. In fact, some of the items that were deregulated earlier were re-regulated during this period. When the Aquino government took over the administration in 1986 the trade reform program of the early 1980s was resumed, which resulted in the reduction of the number of regulated items from 1,802 in 1985 to 609 in 1988. Furthermore, export taxes on all products except logs were abolished.

The government launched a major program in 1991 with the issuance of the Executive Order (EO) 470, which is called the TRP-II and an extension of the previous program, in which tariff rates were realigned over a five-year period. The realignment involved the narrowing of the tariff rates through a series of reduction of the number of commodity lines with high tariffs, and an increase in the commodity lines with low tariffs. In particular, the program was aimed at clustering the commodities with tariffs within the 10-30 range by 1995. Despite the programmed narrowing of the tariff rates, about 10 percent of the total number of commodity lines were still subjected to 0-5 percent tariff and 50 percent tariff rates by the end of the program in 1995.

“Tariffication” of quantitative restrictions (QRs) (i.e., converting QRs into tariff equivalent) started in 1992 with the implementation of EO 8. There were 153 commodities whose QRs were converted into tariff equivalent rates. In a number of cases, tariff rates were raised over 100 percent, especially during the initial years of

the conversion. However, a built-in program for phase-down of the “tariffed” rates over a five-year period was also put into effect. Furthermore, in the same EO, tariff rates on 48 commodities were further re-aligned.

De-regulation continued on the next 286 items under the tariffication program. At the end of 1992, only 164 commodities were covered under the QRs. However, the implementation of the Memorandum Order (MO) 95 in 1993 reversed the de-regulation process. In fact, QRs were re-imposed on 93 items, bringing up the number of regulated items under the QR to 257. This re-regulation came largely as the result of the Magna Carta for Small Farmers in 1991.

Major reforms were implemented under the TRP-III. The program embodied in the following EOs: (i) EO 189 implemented in January 1, 1994 which provided reduced tariff rates on capital equipment and machinery; (ii) EO 204 in September 30, 1994 which mandated tariff reduction in textiles, garments, and chemical inputs; (iii) EO 264 in July 22, 1995 which reduced tariffs on 4,142 harmonized lines in the manufacturing sector; and (iv) EO 288 in January 1, 1996 which reduced tariffs on “non-sensitive” components of the agricultural sector. The restructuring of tariff under these various EOs refers to reduction in both the number of tariff tiers and the maximum tariff rates. In particular, the program was aimed at establishing a four-tier tariff schedule, namely, 3 percent for raw materials and capital equipment that are not available locally; 10 percent for raw materials and capital equipment that are available from local sources; 20 percent for intermediate goods; and 30 percent for finished goods.

Another major component of the tariff program is the uniform tariff rate, which is scheduled to be implemented starting 2004. Policy discussions on the issue, however, are still ongoing. At what level shall the tariff rate be made uniform eventually across sectors is still an unsettled issue at present.

Table 6 shows the weighted average tariff rates in 1994 and in 2000 across various sectors. The overall weighted tariff rate declined over these years by –65 percent: from 23.9 percent in 1994 to 7.9 percent 2000. The decline in the industry tariff rate is much higher than in agriculture: -65.3 percent and –48.8 percent, respectively.

In terms of specific sectors, the largest drop in tariff rates is in mining, -88.9 percent, while the lowest decline is in other agriculture, -19.9 percent. In terms of tariff rate level in 2000, food manufacturing still has the highest rate of 16.6 percent. Other agriculture has the lowest tariff rate of 0.2 percent.

Revenue from import tariff is one of the major sources of government funds as shown in Table 7, which shows the structure of the sources of revenue of the government. In 1990, the share of revenue from import duties and taxes to the total revenue was 26.4 percent. This increased marginally to 27.7 percent in 1995. However, the share dropped significantly to 17.1 percent in 2001. One of the major factors behind the decline was the tariff reduction program.



The share of direct taxes (income and profit direct taxes combined) increased consistently from 27.3 percent in 1990 to 30.7 percent in 1995 and to 39.6 percent in 2001. On the other hand, the share of government revenue from excise and sales taxes dropped from 27.2 percent share in 1990 to 23.4 percent in 1995. It however recovered to 29.3 percent share in 2001.

Since tariff revenue is a major source of government funds, a tariff reduction program could therefore have substantial government budget implications especially if it is not accompanied by compensatory tax financing. In fact, it could pose a major policy challenge especially in a situation where government budget deficit is growing.

The last three years saw widening government budget deficit. From a budget surplus of 0.6 percent of GNP in 1995, the budget balance flipped to a deficit of -3.6 percent in 1999 and another -3.8 percent in 2000. In 2001, the deficit was still at -3.8 percent of GNP. This persistent government imbalance, if remained unchecked could not only create a host undesirable macroeconomic effects, but could also put into question the viability of a continued implementation of the tariff reduction program, unless other compensatory tax financing measures are implemented such as income tax and other excise and indirect taxes.

Table 8 presents the calibrated tariff rates and indirect tax rates from the constructed SAM, which is used in the base simulation.

### **Income Sources, Distribution And Poverty**

Table 9 shows the sources of household income from labor, capital, and others, which includes dividends, government transfers and foreign income in the 1994 SAM. The definition of household definition is based on the head of household, which is shown in the table together with the number of households per category in the 1994 Family Income and Expenditure Survey (FIES) and in the whole country.

The sources of income vary considerably across income groups. The first three categories of urban households greatly depend on labor income, while the last three categories depend on capital income. Furthermore, households in Ur5 depend on dividend income to an important degree, while households in Ur2 to some extent. Also, households in Ur1 depend on government transfer.

Rural households Rur2, and Rur3 largely depend on labor income, while Rur1, Rur4, Rur5 and Rur6 depend heavily on capital income. Households in Rur1 also depend on government transfers. The share of dividend income to the total income for all rural households is very small.

Table 10 presents the structure of household consumption. On the whole, household consumption 12.5 percent comes from agriculture, while 50.8 percent from industry, and the remaining 38.9 percent from the service sector. Of the share from industry, 30.6 percent comes from food manufacturing.

To put the poverty situation in the Philippines in perspective, Table 11 presents the official poverty incidence<sup>5</sup> from 1985 to 2000. Poverty incidence declined by about 10 basis points in the last 15 years from 49.3 percent in 1985 to 39.4 percent in 2000. However, through the years the gap between urban (particularly the National Capital Region, NCR) and rural poverty incidence widened. While urban areas saw significant decline in poverty incidence from 37.9 percent in 1985 to 24.3 percent in 2000, rural places witnessed generally stable incidence of more than 50 percent. The largest improvement in the poverty situation is in the NCR, with the incidence dropping from 27.2 percent in 1985 to 11.4 percent in 2000. Its poverty incidence even dropped to single digit in 1997 (8.5 percent).

Indicators of income distribution do not show favorable signs either. Over the past decade, there was a marked deterioration in the distribution of the country's wealth. During the 12-year period beginning 1985, the wealthiest quintile of families exhibited an increase in its income share, while the other quintiles suffered income reduction. The income share of the poorest or the first quintile fell from 5.2 percent in 1985 to 4.9 percent in 1994 before reaching 4.4 percent in 1997. Conversely, the share of the wealthiest income group improved from 52.1 percent in 1985 to 55.8 percent in 1997.

The deterioration in income distribution during the past decade represented some movement in the income distribution picture, which had been relatively stable since 1961. From the time until the mid-1980s, there were very small movements in the income shares of the different income groups. During this period of relatively "stable inequality", the share of the richest income group remained substantially large while that of the poorest income group remained substantially small.

Since 1961, except for the years 1988-1991, the Gini ratio showed slow but steady decline. However, from 1994 to 1997, however, the Gini ratio worsened significantly from 0.451 to 0.487, the latter representing the highest registered figure in the three and a half-decades. In 1985, the average income of a family belonging to the wealthiest decile was 18 times the income of a family belonging to the poorest decile. In 1997, this went up to 24. In terms of spatial income disparity, the same trend was observed as the ratio of the average family income in the poorest region likewise increased from 3.2 in 1995 to 3.6 in 1997.

In 2000 the Gini coefficient slid down to 0.451.

### **Model Description**

A computable general equilibrium (CGE) model calibrated to the 1994 SAM was employed to analyze the effects of tariff reforms on income distribution and welfare. The model is called PCGEM, whose complete set of equations is presented in the Appendix.

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<sup>5</sup>Head count ratio.

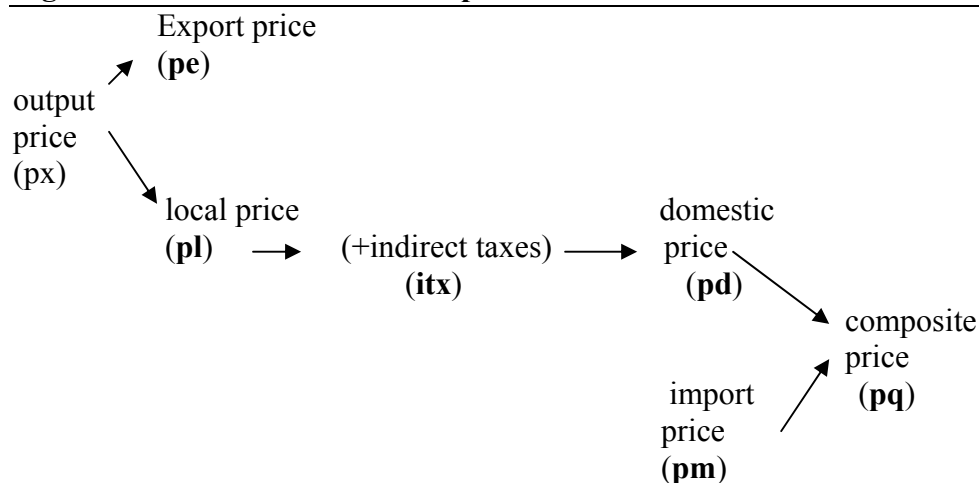
PCGEM has 12 production sectors, 4 of which comprise agriculture, fishing and forestry. There 5 sectors in industry, including utilities and construction. The service sector is composed of 3 sectors, including government service sector. The model distinguishes two factor inputs, labor and capital, which determines sectoral value added using CES production function. The model incorporates 4 types of labor: skilled agriculture labor, unskilled agriculture labor, skilled production labor, and unskilled production labor. Agriculture labor is devoted only to agriculture sector, while production labor works both for non-agriculture and agriculture sector. As such, agriculture labor movement is only limited to agriculture sector, while production workers move across all sectors. Furthermore, skilled production workers include professionals, managerial, and other related workers. Skilled worker is defined as those with at least high school diploma.

Sectoral capital however is fixed. Value added, together with sectoral intermediate input, which is determined using fixed coefficients, determine total output per sector. In both product and factor market, prices adjust to clear all markets.

The household sector is divided into urban and rural. Each category is grouped into six socio-economic classes according to the level of education of the head of household. Table 9 provides a detailed definition of each household class, and the corresponding number of households in each class in the Family Income and Expenditure Survey (FIES) and in the whole Philippines in 1994.

Figure 1 shows the basic price relationships in the model. Output price,  $p_x$ , affects export price,  $p_e$ , and local prices,  $p_l$ . Indirect taxes are added to the local price to determine domestic prices,  $p_d$ , which together with import price,  $p_m$ , will determine the composite price,  $p_q$ . The composite price is the price paid by the consumers.

**Figure 1: Basic Price Relationships in PCGEM**



where  $\mathbf{pm} = \mathbf{pwm} * \mathbf{er} * (1 + \mathbf{tm}) * (1 + \mathbf{itx})$ ;  $\mathbf{pwm}$  is world price of imports;  $\mathbf{er}$  exchange rate;  $\mathbf{tm}$  tariff rate;  $\mathbf{itx}$  indirect tax

Import price,  $p_m$ , is in domestic currency, which is affected by world price of imports, exchange rate,  $e_r$ , tariff rate,  $t_m$ , and indirect tax rate,  $itx$ . Therefore, the direct effect of tariff reduction is a reduction in  $p_m$ . If the reduction in  $p_m$  is significant enough, the composite price,  $p$ , will also decline.

Consumer demand is based on Cobb-Douglas utility functions. Armington-CES (constant elasticity substitution) function is assumed between local and imported goods, while a CET (constant elasticity of transformation) is imposed between exports and local sales. The Armington and the CET elasticities are presented in Table 14.

To analyze the effects on unemployment, the model was extended to incorporate wage curve on all labor types that is based on the specification of Blanchflower and Oswald (1995) and Card (1995). Detailed discussion is given in a separate section below.

The model closure used has the following features:

Government Budget Balance. Nominal government consumption varies, while real government consumption is held fixed. This rationale behind this is to take out any possible effects of variations in government spending on poverty. Its price however is flexible.

Total government income is held fixed as well. Any reduction in government income from tariff reduction is compensated endogenously either by (i) additional indirect tax on output, (ii) direct income tax on households, or (iii) direct tax on firm income.

Government budget balance is flexible due to the endogenously determined price of total real government consumption.

Government transfers to households are held fixed in real terms, while nominal government transfers received by households vary with consumer prices.

Total investment. Total nominal investment is flexible, while its real value is fixed. Holding total real investment fixed avoids intertemporal welfare effects in the simulation, thereby isolating the analysis from the interaction between trade policies and growth issues via changes in the level of real investment. The price of total real investment however is flexible.

Foreign Savings. Current account balance is held fixed. It therefore avoids any influence of international resources financing domestic policy changes. Nominal exchange rate is fixed, since the model does not have any monetary variables. The foreign trade sector is therefore cleared by the real exchange rate, which in effect is the ratio of the nominal exchange rate and domestic prices. Thus exports and imports respond to movements in the real exchange rate.

Private Savings. The propensities to save of the various household groups in the model adjust proportionately to accommodate the fixed total real investment

assumption. Introducing a factor in the household saving function that adjusts endogenously to a policy shock does this<sup>6</sup>.

### Simulation Experiments

Various experiments are conducted to analyze the effects of tariff reduction, which include:

a. Tariff reduction of 100 percent. The simulation is conducted with a compensatory indirect tax<sup>7</sup> using base elasticities<sup>8</sup> (S1). The purpose of this experiment is to examine in detail how the whole system of equations in the model works in terms of identifying the transmission mechanism through which a total elimination of tariff protection affects households.

b. Actual tariff changes between 1994 and 2000 under a compensatory tax on household income<sup>9</sup> (S2). This experiment attempts to capture the actual tariff reform program during the period wherein, as observed in Table 7, the significant decline in the share of government revenue from import duties and other import taxes is offset by the improvement in the share from taxes on income and profits.

c. Actual tariff changes under compensatory tax on household income as in (b) are simulated using an extended model with wage curve equation in each of the labor types (S3). The extension of the model is discussed in a separate section below.

d. Actual tariff changes between 1994 and 2000 under two other possible compensatory taxes: (i) indirect tax on output (S4), and (ii) direct tax on firm income<sup>10</sup> (S5). In both experiments base elasticities are used.

e. Tariff structure of uniform tariff rates under a compensatory tax on household income (S6) formulated as in (b).

f. Sensitivity analysis on the distribution effects of changes in the base elasticities (S7). Base elasticities include the armington elasticities, CET elasticities and the value added elasticities. Base elasticities were analyzed within the +20 percent and -20 percent range. Tariff reduction of 100 percent and compensation taxes on household income formulated as in (b).

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<sup>6</sup>That is, introducing the variable *adj* in Equation (39) in the Appendix.

<sup>7</sup>Formulated as: (Base indirect tax rate of industry *i*) times (1+compensatory indirect tax rate). The set of equations presented in the Appendix incorporates the compensatory indirect tax on output.

<sup>8</sup>Base elasticities for the armington and CET are shown in Table 14, while for the value added is uniform 1.0 across sectors.

<sup>9</sup>Formulated as: (Base direct tax rate on household income - compensatory tax rate on household income). Thus all households share the additional tax equally.

<sup>10</sup>Formulated as: (Base direct tax rate on income of firms) times (1 + compensatory tax rate on income of firms).

Results of simulation exercises **S1**, **S2** and **S3** are discussed in the next section, while the rest are presented in the Annex.

## Simulation Results

### 1. Experiment S1

The results in this experiment are presented in Tables 14 to 19. An across-the-board 100 percent reduction in tariff rate, or total elimination of tariff rates, results in an overall reduction in the domestic price of imports (pm) of –13.6 percent. Similarly, the overall composite price (pq) declines by –3.4 percent, while the domestic prices of local goods (pd) declines by –2.1 percent despite the compensatory indirect tax. The overall value-added price (pva) declines by –2.5 percent (Table 15).

Indeed, the total elimination of tariff results in significant changes in the relative import-domestic price ratios, triggering substitution effects between imports and domestically produced goods. For example, import volume (m) increases by 9.3 percent, while domestic production declines by –1.2 percent. These changes taken together however result in a marginal improvement in the total supply of goods available in the market as shown by the increase in the composite goods (q) of 0.7 percent.

The overall decline in domestic prices creates an effective real exchange depreciation, which in turn increases export competitiveness. This is reflected in Table 14 in the improvement in the sectoral price ratio between export prices and the local prices ( $pe_i/pl_i$ ), where  $pe_i$  is the export price in domestic currency and  $pl_i$  is local prices without indirect taxes<sup>11</sup>. Because of this effect overall export increases by 8.1 percent, which in turn increases total output marginally by 0.4 percent.

### From Tariff Reduction to Reallocation of Production

What are the effects at the sectoral level? The effects vary considerably, triggering reallocation of output across sectors. The effects are largely due to the differences in the sectoral structure of imports and exports, initial tariff rates, and the trade elasticities (armington and CET elasticities<sup>12</sup>). As we shall see below, the differentiated sectoral results, especially on factor prices, contribute largely to the varied effects across household groups.

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<sup>11</sup>Export price in domestic currency is 1 across sectors in the base run. Since the nominal exchange rate and world prices of exports are held price and since there are no export taxes, export price will remain 1 in the simulation experiment. Also, since local prices drop as a result of the tariff cut, the export price-local price ratio will therefore increase in the simulation. This increases exports as indicated in Equation 14 in the Appendix.

<sup>12</sup>The armington and the CET elasticities utilized in the model are based on the elasticities in another CGE model in the Philippines called the Agriculture Policy Experiments model (or the APEX model), which were estimated econometrically, while the initial tariff rates were based on the estimates of Manasan and Querubin.

The sectoral results would have to be compared with the base values in Table 12. Industry realizes the largest drop in import prices (-16.0 percent) as compared to agriculture's import prices drop of -4.7 percent and service sectors' import price increase of +4.8 percent. The increase in the service sector's import price is largely due to the new sale taxes, which by design was introduced endogenously in all sectors as a compensatory tax. In terms of specific sectors, the largest drop in import prices is observed in mining (-27.9 percent), in food manufacturing (-21.6 percent), and in non-food manufacturing (-14.5 percent). These differentiated effects are due to the different levels of the initial tariff rate before the total elimination of tariff experiment.

The sectoral effects on import volume are due to the differentiated effects on import prices and on the differences in the armington elasticities. All these factors together results in the largest increase in import volume of fishing (29.1 percent), of food manufacturing (28.8 percent) and of crops (20.0 percent). Import volume of the non-food manufacturing sector registers an increase of 9.1 percent only. However, since the non-food manufacturing sector is the largest importer (76.1 percent of total imports, see Table 5c), the increase in the overall import volume largely comes from this sector.

One set of results that need further elaboration is the effect on non-food manufacturing sector's imports (m), domestic production (d) and the composite (q), since this sector is a major contributor to the total. One may observe that the decline in its import prices is twice as much as the drop in its domestic prices, i.e., -14.5 percent and -6.6 percent, respectively. Thus, the relative price change favoring imports should lead to reduction in domestic production. However, the result on domestic production indicates an increase of +0.6 percent. There are no inconsistencies in the results because the composite good (q) for the sector registers an increase of 4.7 percent<sup>13</sup>.

Except for livestock, all sectors register an increase in exports. The increase is largely attributed to the improvement in the export competitiveness across sectors as we have seen earlier. To reiterate, export competitiveness is indicated by the decline in the price ratio ( $pe_i/pl_i$ ), where  $pe_i$  is the export price in domestic currency and  $pl_i$  is local prices without indirect taxes. One may observe from the results that the largest increase in export competitiveness is in mining (-11.5 percent), and in non-food manufacturing (-8.5 percent). The results on the mining sector though may be of less interest because its share to the total export is very small. But the result on the non-food manufacturing is critical as it contributes largely to the overall exports of the country (48.2 percent to total exports, see Table 5c). This result, together with the increase in domestic production for non-food manufacturing, brings about an overall increase in its total production of 5.2 percent. This is the only sector that registers a

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<sup>13</sup>If one puts these results in the framework of production theory where imports and domestic production are factor inputs and one isoquant indicates one level of output, the results would indicate an outward shift in the isoquant since q is higher together with higher imports and domestic production.

significant increase in output. Marginal increases are observed in other agriculture (+0.7 percent) and in utilities<sup>14</sup> (+0.6 percent).

It is very clear from the results thus far that a total elimination of tariff will bring about reallocation of production favoring the non-food manufacturing sector.

#### From Reallocation of Production to Factor Markets

What happens to the flow of resources across sectors? Since all sectoral capital is fixed, this pertains to the sectoral movement of labor. The results on factor price ratios and capital-labor ratios are therefore important in assessing labor movements. The results are presented in Table 15.

The elimination of tariff results in the reduction of both the average rate of return to capital and the overall average wage of aggregate labor. However, the drop in the former is slightly higher (-2.6 percent) than in the latter (-2.0 percent). Practically all sectors register declining rate of turn to capital except for the non-food manufacturing sector with an increase of 9.5 percent.

The increase in the rate of return to capital in the non-food manufacturing sector relative to the decline in wages results in factor substitution favoring labor. This is seen in the decline in the capital-labor ratio from 1.23 in the base (Table 12) to 1.10 after total tariff elimination (Table 15). In fact, the non-food manufacturing sector is the only sector with noticeable decline in the capital-labor ratio, indicating movements of labor towards this sector. The results indicate that the non-food manufacturing sector absorbs labor from other sectors. In fact, its employment increases by 12.1 percent.<sup>15</sup> Utilities and other agriculture also employ additional labor displaced from the other sectors, 2.8 percent and 1.3 percent, respectively.

Furthermore, it is interesting to note that in terms of the different types of labor, there is a tendency for the demand for skilled labor to be pulled up. For example, the demand for labor is higher for L3 (skilled production labor) than for L4 (unskilled) in the case of the non-food manufacturing sector, i.e., 12.0 percent for L3 and 9.5 percent for L4. In the case of utilities and other agriculture, the demand for L3 indicates an increase also.

In sum, the results of the experiment indicate that the non-food manufacturing sector benefits from both the effects of output reallocation and labor movement. Furthermore, there are indications that show, as a result of the shifts in the output and factor price ratios, factor substitution favors skilled production workers in non-food manufacturing, utilities and other agriculture sectors. Also, the results show that agriculture wages decline while production wages improve. All these will have important implications on income of households as discussed below.

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<sup>14</sup>Electricity, gas and water.



## From Factor Markets to Household Income and Household Savings

What are the effects on the sources of income of households? Since the model recognizes 4 types of labor, each with different labor market conditions, the resulting market-clearing wages have to be taken into account in the analysis. Also, since marketing-clearing rate of return to capital varies across sectors, they also have to be considered.

Table 15 indicates that agriculture wages, both skilled and unskilled, decline by –4.0 percent. Wages for skilled production workers decline by –2.0 percent, while wages for unskilled remain the same on the average. The decline in agriculture wages is largely due to the overall decline in the demand for labor in agriculture<sup>16</sup>, which in turn is the result of the decline in the overall agriculture output. In particular, the decline in agriculture wages is due to the overall decline in the value added of agriculture by –1.0 percent and the drop in the price of value added by -3.2 percent. Since the supply of agriculture workers is fixed, the decline in both the value added and the price of value added translate into a drop in the value of the marginal product of agriculture, which is actually the demand curve for labor in the sector. The drop in the labor demand in turn leads to therefore to lower wages. The same mechanism is in effect that results in the decline in the wage rate for L3 by –2.0 percent and the zero change in the wage rate for L4.

As a result of the general decline in factor prices, both overall household labor and capital income decline, -2.3 percent and –2.6 percent respectively (Table 17). The results across households vary, which is largely due to the fact that various households have varying degree of sources of income.

Government transfers to households decline by –3.5 percent, primarily due to declining prices.<sup>17</sup> Because of declining factor prices and general prices, total income of household declines by -2.2 percent. The highest decline is observed in Rur2 (-3.3 percent) followed by Rur2 (-2.6 percent).

Real total investment is held fixed. However, total nominal investment is endogenous because of the endogenous price index for investment. Since prices decline as a result of the elimination of tariff, the overall price index of investment declines by –5.42 percent, resulting in a drop in the nominal total investment by –23.7 billion pesos (Table 19). Since by design total savings in the economy is equal to total investment, lower nominal total investments leads to a lower overall private savings by a factor of 0.166 (i.e., from an adjustment factor of 1 in the base to 0.834 in the simulation run)<sup>18</sup>.

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<sup>16</sup>Factor demands are based on equality of the value of marginal production and factor price.

<sup>17</sup>In the model government transfers enter into household income as government transfers, which is fixed at the base, multiplied by the general price index as measured by the variable pindex, which is the weighted average of the composite prices, pq.

<sup>18</sup>Taken directly from the output of GAMS.

## From Household Income to Household Consumption

What are the effects at the level of household consumption? As modeled, there are two major factors influencing household consumptions: domestic prices and household income. The effect on domestic prices is discussed below, while the effect on income was earlier discussed in the previous section.

The design of this particular experiment (S1) is such that the compensatory tax of tariff rate reduction is introduced through additional indirect tax, which is determined endogenously. Given this, one can observe that while domestic prices of imports ( $pm_i$ ) drop significantly as a result of the total elimination of tariff, the drop in domestic prices ( $pd_i$ ) is a lot less, -13.6 percent versus -2.1 percent (Table 16). In fact, some sectors show higher domestic prices; like fishing, other agriculture, food manufacturing, and the whole of the service sector. This increase is largely due to the compensatory tax, which results in much higher indirect tax per sector after the experiment.

The household consumption effects are summarized in Table 16. However, for better analysis one may have to make references to the base consumption shares in Table 10. One noticeable set of results is the dominating effects on household consumption from non-food manufacturing, with percentage changes in the consumption shares ranging from 12 to 14 percent across household groups. However, the effects coming from food manufacturing sector on household consumption are significantly lesser than from non-food manufacturing because of the differences in the effects on domestic price and import price in these sectors. Because of tariff elimination the composite price ( $pq_i$ ) for non-food manufacturing drops by -10.6 percent as compared to the -0.7 percent drop for food manufacturing (Table 14). Furthermore, because of the differences in the structure of the sectoral indirect taxes as discussed earlier the effects on domestic prices ( $pd_i$ ) vary significantly as well. For example, while domestic price for food manufacturing increases by 1.5 percent, it declines by -6.6 percent for non-food manufacturing. Output from both food and non-food manufacturing sectors take a big share in the household consumption basket (Table 10).

Output from other services sector has a large share as well in the household consumption but the effects are generally minimal because there are no tariff rate reductions on this particular sector. Instead, there are additional indirect taxes as a result of the compensatory indirect tax. Therefore,  $pm_i$  for other services sector increases by 4.8 percent, while for  $pd_i$  by 1.3 percent and for  $pq_i$  by 1.5 percent.

Furthermore, there are few relatively large effects coming from other sectors such as the 9.7 percent increase in the consumption share of Ur6 from utilities, and 7.8 percent increase of Rur6 from livestock, and 6.8 percent increase of Ur6 from livestock also.

### Link Between Trade Reforms and Household Welfare

What are the effects on household welfare? The effects on household welfare are estimated through the equivalent variation (EV) welfare measure, computed as the percentage change from the benchmark consumption. In particular, the following equation was utilized

$$EV_h = 100 * \frac{\left( \sum_{td} Ch_{td,h} \cdot \prod_{td} \left[ \frac{PQ_{0,td}}{PQ_{1,td}} \right]^{Kt\_ch} - \sum_{td} Ch_{0,td,h} \right)}{\sum_{td} Ch_{0,td,h}}$$

where  $EV_h$  is household welfare,  $Ch_{td,h}$  and  $Ch_{0,td,h}$  are household consumption before and after the simulation experiment,  $PQ_{0,td}$  and  $PQ_{1,td}$  are composite prices before and after the simulation.  $Kt\_ch$  is household consumption parameter. From the equation, it is clear that trade reforms affect household welfare through the effects on prices and consumption. As discussed earlier, household consumption is influenced by household income and prices. Thus, the welfare effects shown in Table 18 are presented together with the effects on prices and income at the level of households.

The price effects on household are computed using the sectoral composite price weighted by the consumption shares of households at the base. The results indicate that, indeed, the effects of tariff elimination are favorable in the sense that prices decline. On the average, prices drop by -1.06 percent.

Because of generally declining factor prices, wage and return to capital as discussed earlier, nominal household income declines. The drop is largest for Rur1 (-3.29 percent) and lowest for Ur6 (-1.62 percent). Total household income declines by -2.23 percent. The effects on nominal net income are generally the same as the nominal income because there are no new income taxes in this simulation experiment (Table 17).

The decline in nominal household income is more than offset by the drop in consumer prices. This translates into higher overall household welfare as measured by the percent increase in the equivalent variation (EW) of 1.96 percent. All household types enjoy positive increase in the EV. The effects vary across households; the highest increase of 3.33 percent is observed for Ur6 and the lowest of 0.73 percent for Rur1. On the whole, urban households have higher increase in their EV than rural

### Link Between Trade Reform, Poverty, and Income Inequality

The analysis of the effects of tariff reform on poverty and income inequality is discussed in a separate paper on microsimulation in which the whole 24,797 households in the 1994 Family Income and Expenditure Survey were included instead

of the 12 household types in the present model <sup>19</sup>. Various poverty and inequality indices are discussed in the paper

### Trade Reforms and Macroeconomic Effects

Table 19 shows the macroeconomic effects of the experiment. One should note that a number of macroeconomic variables are fixed by design so that only the change in tariff rate is captured in the simulation experiment. Tariff revenue drops to zero as a result of the elimination of tariff. The drop is compensated by the increase in indirect taxes, also by design under the present the experiment. Prices of government spending and investment decline, while their corresponding real values are held fixed. The balance of trade deteriorates because imports grow faster than exports. The overall government balance improves partly due to the decline in nominal value of government consumption.

### Summary Effects Under S1

The results of this under indicate that a total elimination of tariff rate with compensatory indirect tax will: (a) reduce all prices expressed in domestic currency, (b) substitution in favor of imports, (c) increase exports because of improved competitiveness, (d) resource allocation in terms of output and factors in favor of non-food manufacturing sector, and (e) lower household income because of lower factor prices. However, the drop in prices is observed to have more than offset the decline in household income. Thus, overall household welfare improves as well as across household groups.

## 2. Experiment S2

This experiment is more realistic as compared to the first in the sense that it incorporates the actual reduction in tariff rate over the period as presented in Table 6. Furthermore, the compensatory tax is through additional household income tax, which is consistent with the fact that, as observed in Table 7, the share of government revenue from taxes on net income and profits increased during the period when the share of revenue from import duties and other import taxes dropped.

The results of the experiment are presented in Table 21 to 26. However, discussion will not be as detailed as in the first experiment because there are similarities in some of the results in terms of the direction of change. What will be highlighted are the results on output prices, factor prices, and household income as these are the ones that trigger the difference between the effects under the present experiment and the effects in first exercise.

The overall import price in domestic currency drops by –10.4 percent (Table 21), which is lower than the decline of –13.6 percent in S1 (Table 14). The difference is due to the actual tariff reduction in S2 is much lesser than the total tariff elimination in S1, i.e., -65 percent in the former as compared to –100 percent in the latter. Despite

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<sup>19</sup>Cororaton C.B. 2003. “Analysis of Trade Reforms, Income Inequality and Poverty Using Microsimulation Approach: The Case of the Philippines”

this, however, the impact on local prices is higher in S2 than in S1. For example, the overall domestic price (pd) drops by -3.2 percent in S2 as compared to the -2.1 percent drop in S1. Similarly, the composite price (pq) drops by -4.0 percent in S2, which is higher than the drop of -3.4 percent in S1. The difference is largely due to the effects on indirect taxes. Indirect tax increases by +7.1 percent in S1 (Table 16) as compared to only +3.0 percent increase in S2 (Table 23).

Importance differences that need to be highlighted are those on sectoral domestic prices, especially those sectors that have large shares in the consumer basket like food manufacturing. The domestic price (pd) for food manufacturing drops by -1.8 percent (Table 21) in the present experiment as compared to +1.5 percent increase in S1 (Table 14). The composite price (pq) for the sector drops by -2.9 percent in S2 as compared to the -0.7 percent decline in S1. Another important sector is fishing where S2 generates negative domestic price effects as compared to positive price increase in S1. However, for non-food manufacturing sector the reduction in domestic prices is marginally lower in the present experiment (-6.2 percent) than in S1 (-6.6 percent).

There are differences in the effects on factor prices as well, which are largely due to the presence of compensatory indirect tax on output in S1 that affects the factor demand curves. In particular, the compensatory indirect tax shifts the demand curves for factors towards the origin. Thus, while the average rate of return to capital declines by -2.6 percent in S1 (Table 15), in the present experiment it registers an increase of +0.9 percent (Table 22). While both experiments generate negative agriculture wages, the decline in S2 is much lower than the drop in S1, -1.0 percent and -4.0 percent respectively. Furthermore, while the wage rate for L3 increases by +1.0 percent in S2, it declines by -2.0 percent in S1. Also, while wage rate for L4 remains the same in S1, it improves by 3 percent in S2.

The effects on factor incomes are presented in Table 24 under the present experiment. Total labor income increases by 1.1 percent under S2, while it drops by -2.3 percent under S1 (Table 17). Capital income improves by 0.8 percent under S2, while it declines by -2.6 percent under S1. However, government transfers drops by -4.1 percent under S2, which is higher than the -3.5 percent drop under S1. This is due to the differences in the drop of the PINDEX variable in the two scenarios. On the whole, while factor incomes increase by 0.6 percent under S2, it declines by -2.2 percent under S1.

There are differences in the effects on labor income at the various income groups. While all groups realize negative change in labor income under S1, all enjoy improvement under S2. Table 24 shows that the lowest increase in labor income is observed in Rur1 (+0.3 percent) under S2, while the highest is seen in Ur1 (+1.8 percent).

There are differences in the effects on capital income as well. While all income groups observe negative change in capital income under S1, only Rur1 and Ur1 suffer a decline in capital income under S2 (-0.9 percent and -0.3 percent, respectively in Table 24).

All these effects lead to higher increase in nominal household income of +0.61 percent in S2 (Table 25), as compared to an average drop of –2.23 percent in S1. Domestic prices drop by –2.8 percent on the average in the present exercise as compared to a drop of only –1.06 percent in S1. As a result total household welfare improves by +3.22 percent under S2 as compared to only +1.96 percent increase under S1.

### Summary Effects Under S2

The results under this experiment involving actual tariff reduction with a compensatory tax on household income that is shared equally across household groups indicate that: (a) the drop in domestic prices is a lot higher than the previous experiment because of the absence of additional compensatory indirect tax; (b) resource allocation of output and factors in favor of the non-food manufacturing sector; (c) higher factor prices as compared to the previous experiment, again because of the absence of additional indirect tax that creates a dampening effects on factor demand, (d) positive household income effects. Positive household income effects together with the higher drop in prices results in higher household welfare effects.

### 3. Experiment S3

Experiment S3 simulates S2 again, but this time using a modified model that incorporates wage curve equations in all labor types. The wage curve equation is based on the specification of Blanchflower and Oswald (1995) and Card (1995), which relates wages with unemployment in the following form.

$$\frac{w_i}{pvaind_j} = kt\_wage\_i \cdot unemp\_i^{elas\_wge}$$

where  $w_i$  is wage rate of labor type  $i$ ;  $pvaind\_j$  is weighted index of value added price in major sector  $j$ ;  $kt\_wage\_i$  is scale parameter;  $unemp\_i$  is unemployment rate in labor type  $i$ , and  $elas\_wge$  is wage curve elasticity, which is -0.1. There are four labor types: skilled agriculture labor, unskilled agriculture labor, skilled production labor and unskilled production labor.

Unemployment rate is determined by the following equation

$$unemp\_i = \frac{(ls\_i - \sum_s l\_i_s)}{ls\_i}$$

where  $ls\_i$  is supply of labor of labor type  $i$ , and  $l\_i_s$  labor demand in production sector  $s$ .

Table 27 presents the unemployment rate by level of education. One can observe that there is relatively higher unemployment rate in labor categories with lower level of education. In fact, for unskilled labor, defined loosely as those with

zero education up to third year high, unemployment rate was 5.97 percent in 1990 as compared to 11.39 percent for those with educational level of at least fourth year high school. The gap in the unemployment rates continued even in 2000. For purposes of the simulation, the numbers for 1995 were utilized, i.e., for unskilled workers in agriculture and non-agriculture sectors, the unemployment rate applied is 6.12 percent, while for skilled 11.36 percent.

The results of the simulation are presented in Table 28 to 33. The price and volume effects are generally the same as in experiment S2, except for the slight difference in the overall change in domestic price,  $p_d$  (-3.2 percent in S2 versus -2.5 percent in S3). Focus on the effects on factors in Table 29, particularly on unemployment rates and wage rates. Because of the decline in agriculture as discussed earlier, unemployment rate increases by 4.4 percent in skilled agriculture labor and 8.2 percent in unskilled agriculture labor. However, resource allocation effects in favor of industry as discussed earlier also, in particular towards non-food manufacturing sector, unemployment rate decreases by -1.8 percent in skilled production labor and -13.1 percent in unskilled production labor. Because of the introduction of the wage curve equations into the system, the impact on the wage rates across labor types has been dampened. That is, instead of the -1.0 percent decline in wages for both skilled and unskilled production labor in S2 (Table 22), in the present analysis in S3 the decline is reduced marginally to -0.5 percent and -0.7 percent, respectively (Table 29). In the case of production labor, wages increase under S2 by 1.0 percent and 3.0 percent for skilled production labor and unskilled production labor respectively (Table 22), while under S3 they increase by 1.1 percent for skilled production labor and 2.2 percent for unskilled production labor. Thus, the introduction of the wage curve equations into the system lessens the fluctuations in wages as a result of a policy shock.

The difference of the impacts on household income and welfare are minimal if one compares the results in Table 25 for S2 and Table 29 for S3. Just the same, the reduction in tariff is welfare-improving.

In sum, the introduction of unemployment into the analysis through the use of wage curve equations does not change the welfare-improving effects of tariff reduction. It only minimizes the fluctuation in wages for a given policy change.

### **Summary and Conclusion**

The following insights can be drawn from the experiments:

1. Tariff reduction results in a drop in both the domestic price of imports and the domestic price of locally produced goods. The decline in import prices results in higher imports, while the drop in local prices effectively increases export competitiveness, which in turn translates into higher exports. Although higher imports put pressure on local production, the export pull effect as a result of improved competitiveness offsets the negative effect on output. Thus, overall output improves. Also, the supply of goods available in the market improves.

2. The non-food manufacturing sector benefits from both the effects of output reallocation and labor movement. Furthermore, there are indications that show that, as a result of changes in output and factor price ratios, factor substitution favors skilled production workers in non-food manufacturing, utilities and other agriculture sectors.

3. Agriculture wages decline as a result of the drop in output of agriculture. If the compensatory tax is through additional indirect tax, there is a strong tendency for factor prices to decline, resulting in a drop in household income. This is because the additional indirect tax creates a dampening effect on factor demand. With labor supply fixed, any drop in factor demand results in lower factor prices. However, a more realistic experiment involves a compensatory tax on household income, as reflected in the official data on government revenue. In the experiment where this is incorporated and where all households share the additional tax equally, only agriculture wages drop. Production wages as well as the return to capital increase. This translates into favorable household income effects.

4. The favorable income effects, together with the drop in consumer prices as a result of tariff reduction, translate into higher household welfare. Given the significant drop in the overall tariff rates, the welfare effect is relatively small: 2.4 percent of the total value added or 2.7 percent of the total household income.

5. The introduction of unemployment through the use of wage curve equations into the system minimizes the fluctuation in wages across labor types for a given policy shock. It does not alter the welfare-improving result of a tariff reduction.

6. One of the major channels through which the generally welfare-improving tariff reduction effects have been achieved is through the reduction in domestic and consumer prices. Household welfare improves not so much from the improvement in income through favourable factor prices, but from the reduction in domestic and consumer prices. However, one should note that these sets of results were arrived at from a series of simulation exercises using a competitive equilibrium model. As such there are no oligopolistic market structures built into it, so that any tariff reduction should in principle translates into lower domestic and consumer prices. Are the results realistic considering the fact that the sector that benefits the most in terms of resource reallocation and factor movement is the non-food manufacturing sector, which is believed to have strong oligopolistic structure in the Philippines? This issue can be addressed quantitatively if the model is extended to accommodate non-competitive market structure, but that is beyond the scope of the present paper. However, in the absence of such an extended model, at this juncture it would be fitting to look at the trend of the rate of inflation in the 1990s and onwards, the period when reforms intensified (Figure 2 Annex). From a high of 18.7 percent in 1991, inflation rate declined slowly but surely to reach 3.1 percent in 2002. There was a short bleep though of 9.7 percent in 1998, which was caused largely by a severe drought brought about by the El Nino effect<sup>20</sup>. For sure, inflation is caused by a host of factors including supply pressures, but the competition brought in by the lowering of tariff rates in the 1990s has certainly put a strong downward pressure on inflation rate in recent years.

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<sup>20</sup> Agriculture production registered the highest drop in output in 30 years.



## **Annex**

### **Additional Simulation Results**

For completeness, this Annex presents the results of simulation exercises **S4**, **S5**, **S6** and **S7**.

**Experiment S4.** This experiment simulates actual tariff changes, compensatory indirect tax and base elasticities. The results under this experiment may be compared with the results in S2. The results are summarized in Table 31.

The price effects are relatively lower in this experiment than in S2 as expected because of the offsetting effects coming from the compensatory indirect taxes. On the other hand, the effects on volume are relatively higher in this experiment than in S2, but the direction of change is generally the same: higher imports, lower demand for domestic output because of substitution effects, higher exports because of improved competitiveness due to lower local prices, higher output because of higher exports.

Factor prices, rate of return capital and wages, in this experiment drop except for wages of the L4. Similar to S1 above, this is due to the dampening effect of additional indirect taxes on factor demand.

The impact of lower factor prices is declining household income. However, the generally lower consumer prices offset the negative effects of declining factor prices, so that the net result on household is generally positive.

**Experiment S5.** This experiment involves actual tariff reduction, compensatory tax on firm income, and base elasticities. The results from this experiment may have to be compared with the results in S2 as well. The results are presented in Table 32.

The price and volume effects are generally the same as in S2. The difference is in household income and in welfare for households that depend heavily on firm income such as Ur2 and Ur5.

**Experiment S6.** This experiment involves a tariff reduction to 5 percent in sectors that have initially tariff rates of above 5 percent; compensatory tax on household income; and base elasticities.

The results are presented in Table 33. Of all the experiments, this generates the highest improvement in household welfare of 4.35 percent.

**Experiment S7.** This involves complete elimination of tariff as in S2, compensatory tax on household income, and various combinations of the values of the armington, CET and value added elasticities to analyze the effects on the results. Sensitivity analyses are conducted in which the base elasticities are increased by +20 percent, and decreased by –20 percent, except for export elasticities where the base values are reduced by only –5 percent. The results are compared with the results of S2. They are presented in Figures 3-Annex, 4-Annex and 5-Annex.

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**Table 1: The Philippine Economy**

	<b>GDP Growth</b>	<b>Export/ GDP</b>	<b>Import/ GDP</b>
<b>1967-72</b>	4.8%	13.6%	17.4%
<b>1973-82</b>	5.5%	16.0%	22.8%
<b>1983-85</b>	-4.1%	15.4%	20.4%
<b>1986-90</b>	4.5%	17.4%	23.0%
<b>1991-93</b>	-0.1%	19.5%	30.2%
<b>1994-97</b>	4.9%	24.5%	39.3%
<b>1998-2000</b>	3.5%	45.8%	43.2%

Sources: National Income Accounts, Philippine Statistical Yearbook,  
and Selected Philippine Economic Indicators

**Table 2: Production Structure**

	<b>Gross value added shares</b>				
	<b>Agriculture</b>	<b>Industry</b>			<b>Services</b>
		<b>Manufacturing</b>	<b>Non-Manufacturing</b>	<b>Total</b>	
1967-72	29.3%	24.7%	7.0%	31.7%	39.0%
1973-82	27.9%	25.6%	11.1%	36.8%	35.3%
1983-85	23.9%	24.7%	12.7%	37.4%	38.7%
1986-90	23.1%	25.0%	9.7%	34.7%	42.2%
1991-93	21.5%	24.4%	8.8%	33.2%	45.4%
1994-97	20.7%	22.8%	9.4%	32.2%	47.0%
1998-2000	17.2%	21.9%	9.0%	30.9%	52.0%

Sources: National Income Accounts, Philippine Statistical Yearbook

**Table 3: Employment Structure**

	<b>Employment Shares</b>				
	<b>Agriculture</b>	<b>Industry</b>			<b>Services</b>
		<b>Manufacturing</b>	<b>Non-Manufacturing</b>	<b>Total</b>	
1967-72	55.1%			15.5%	29.4%
1973-82	52.5%			14.7%	32.7%
1983-85	50.0%	9.9%	4.6%	14.6%	35.5%
1986-90	46.9%	10.0%	5.0%	15.0%	38.0%
1991-93	45.3%	10.4%	5.4%	15.9%	38.9%
1994-97	43.0%	10.1%	6.1%	16.2%	40.7%
1998-2000	38.4%	9.8%	6.5%	16.3%	45.3%

Sources: Philippine Statistical Yearbook

**Table 4: Production and Factors (1994 Social Accounting Matrix)**

	Output		Value Added (%)		Factor Shares in Value Added(%)		Sectoral Factor Shares (%)	
	Value (Pb)	Share (%)	VA/X	Share	labor	capital	labor	capital
Crops	219.8	6.8	77.7	10.3	50.6	49.4	11.6	9.28
Livestock	128.3	4.0	58.1	4.5	50.4	49.6	5.1	4.06
Fishing	86.3	2.7	71.7	3.7	35.8	64.2	3.0	4.37
Other Agriculture	27.6	0.9	82.3	1.4	50.1	49.9	1.5	1.25
<b>AGRICULTURE</b>	<b>462.0</b>	<b>14.3</b>	<b>71.4</b>	<b>20.0</b>	<b>47.7</b>	<b>52.3</b>	<b>21.2</b>	<b>19.0</b>
Mining	30.5	0.9	55.0	1.0	46.6	53.4	1.1	0.98
Food Manufacturing	474.8	14.7	30.8	8.8	36.5	63.5	7.2	10.19
Non-food Manufacturing	744.6	23.0	29.7	13.4	44.8	55.2	13.3	13.40
Construction	173.1	5.3	52.8	5.5	43.8	56.2	5.4	5.65
Electricity, Gas and Water	87.6	2.7	53.0	2.8	25.2	74.8	1.6	3.81
<b>INDUSTRY</b>	<b>1510.7</b>	<b>46.7</b>	<b>34.5</b>	<b>31.6</b>	<b>40.6</b>	<b>59.4</b>	<b>28.5</b>	<b>34.0</b>
Wholesale trade & retail	367.0	11.3	64.1	14.2	34.0	66.0	10.8	17.06
Other Services	714.1	22.1	61.4	26.6	37.9	62.1	22.4	29.95
Government services	183.4	5.7	69.0	7.7	100.0	0.0	17.1	0.00
<b>SERVICES</b>	<b>1264.5</b>	<b>39.1</b>	<b>63.3</b>	<b>48.5</b>	<b>46.5</b>	<b>53.5</b>	<b>50.2</b>	<b>47.0</b>
<b>TOTAL</b>	<b>3237.2</b>	<b>100.0</b>	<b>51.0</b>	<b>100.0</b>	<b>44.9</b>	<b>55.1</b>	<b>100.0</b>	<b>100.0</b>

Source: 1994 Social Accounting Matrix estimated by the author.

VA : Value added

X : Total Output

**Table 5a: Merchandise Exports (million US dollars)**

	Value			Shares (%)		
	1990	1995	2000	1990	1995	2000
Coconut Products	503	989	595	6.1	5.7	1.6
Sugar and Products	133	74	57	1.6	0.4	0.2
Fruits and Vegetables	326	458	528	4.0	2.6	1.4
Other Agro-based Products	431	575	486	5.3	3.3	1.3
Forest Products	94	38	44	1.1	0.2	0.1
<b>Agriculture-based</b>	<b>1,487</b>	<b>2,134</b>	<b>1,710</b>	<b>18.2</b>	<b>12.2</b>	<b>4.6</b>
Mineral Products	723	893	650	8.8	5.1	1.7
Petroleum Products	155	171	436	1.9	1.0	1.2
Manufactures	5,707	13,868	33,989	69.7	79.5	91.2
Electrical and Electrical Equipment	1,964	7,413	22,178	24.0	42.5	59.5
Garments	1,776	2,570	2,563	21.7	14.7	6.9
Textile Yarns/Fabrics	93	208	249	1.1	1.2	0.7
Others	1,874	3,677	8,999	22.9	21.1	24.1
Others Exports	114	381	502	1.4	2.2	1.3
<b>Industry-based</b>	<b>6,699</b>	<b>15,313</b>	<b>35,577</b>	<b>81.8</b>	<b>87.8</b>	<b>95.4</b>
Total Merchandise Exports	8,186	17,447	37,287	100.0	100.0	100.0
Current Account Balance	(2,695)	(3,297)	9,349			

Source: Balance of Payments Accounts:

Selected Philippine Economic Indicators, Bangko Sentral ng Pilipinas

**Table 5b: Merchandise Imports (million US dollars)**

	Value			Shares (%)		
	1990	1995	2000	1990	1995	2000
Capital Goods	3122	8029	12161	25.6	30.4	40.0
Raw Materials and Intermediate Goods	5808	12174	12062	47.6	46.1	39.7
Unprocessed Raw Materials	862	1562	1338	7.1	5.9	4.4
Semi-Processed Raw Materials	4946	10612	10724	40.5	40.2	35.3
Chemicals	1367	2406	2618	11.2	9.1	8.6
Textile Yarn/Fabric	547	872	804	4.5	3.3	2.6
Iron and Steel	572	1312	856	4.7	5.0	2.8
Materials for Eletrical Equipment	1106	3772	4208	9.1	14.3	13.9
Others	1354	2250	2238	11.1	8.5	7.4
Mineral Fuels abd Lubricants	1842	2461	3877	15.1	9.3	12.8
Consumer Goods	1061	2784	2523	8.7	10.5	8.3
Others	373	943	-244	3.1	3.6	-0.8
Total Imports	12206	26391	30379	100.0	100.0	100.0

Source: Selected Philippine Economic Indicators, Bangko Sentral ng Pilipinas

**Table 5c: Imports and Exports Shares  
(1994 Social Accounting Matrix)**

	Shares (%)	
	Imports	Exports
Crops	0.7	3.1
Livestock	0.6	0.0
Fishing	0.0	3.4
Other Agriculture	0.1	0.0
<b>AGRICULTURE</b>	<b>1.5</b>	<b>6.5</b>
Mining	6.5	2.5
Food Manufacturing	5.4	8.6
Non-food Manufacturing	76.1	48.2
Construction	0.9	0.3
Electricity, Gas and Water	0.0	0.2
<b>INDUSTRY</b>	<b>88.8</b>	<b>59.7</b>
Wholesale trade & retail	0.0	14.3
Other Services	9.7	19.5
Government services	0.0	0.0
<b>SERVICES</b>	<b>9.7</b>	<b>33.8</b>
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>
Total Value (Pb)	530.1	535.5
Current Account Balance (P billion)		99.9

Source: Official 1994 Input-Output Table

**Table 6: Tariff Rates**

	Tariff Rates (%)		
	1994	2000	% Change
Crops	15.9 %	8.7 %	-45.6
Livestock	0.7 %	0.3 %	-57.6
Fishing	34.1 %	8.0 %	-76.4
Other Agriculture	0.3 %	0.2 %	-19.9
<b>AGRICULTURE</b>	<b>8.8%</b>	<b>4.5%</b>	<b>-48.8</b>
Mining	44.1 %	4.9 %	-88.9
Food Manufacturing	37.3 %	16.6 %	-55.4
Non-food Manufacturing	21.1 %	7.6 %	-64.0
Construction			
Electricity, Gas and Water			
<b>INDUSTRY</b>	<b>24.1%</b>	<b>8.4%</b>	<b>-65.3</b>
Wholesale trade & retail			
Other Services			
Government services			
<b>SERVICES</b>			
<b>TOTAL</b>	<b>23.9%</b>	<b>7.9%</b>	<b>-65.0</b>

Source of basic data: Manasan & Querubin,1997

**Table 7: Sources of National Government Revenue (%)**

	1990	1995	1999	2000	2001
<b>Tax Revenue</b>	83.9	85.7	90.2	89.1	86.9
Taxes on net Income and Profits	27.3	30.7	38.5	38.6	39.6
Excise and Sales Taxes	27.2	23.4	32.9	28.1	29.3
Import Duties and other Import Taxes	26.4	27.7	18.5	19.3	17.1
Other Taxes	3.0	3.9	0.4	3.1	0.9
<b>Non-Tax Revenue</b>	14.8	14.0	9.7	10.6	12.8
<b>Grants</b>	1.3	0.3	0.0	0.3	0.4
<b>Total</b>	100.0	100.0	100.0	100.0	100
<b>(Deficit)/Surplus (billion pesos)</b>	(37.2)	12.1	(111.7)	(134.7)	(147.0)
<b>(Deficit)/Surplus (% of GNP)</b>	-3.5	0.6	-3.6	-3.9	-3.8

Source: Selected Philippine Economic Indicators, Bangko Sentral ng Pilipinas

**Table 8: Average Tax Rates (1994 Calibrated SAM values)**

	Tariff Rates	Indirect
	( % )	Tax Rates ( % )
Crops	14.9	1.9
Livestock	0.6	1.8
Fishing	31.9	2.9
Other Agriculture	0.3	2.2
<b>AGRICULTURE</b>	<b>8.1</b>	<b>2.1</b>
Mining	40.9	1.2
Food Manufacturing	33.6	3.7
Non-food Manufacturing	19.5	1.6
Construction	-	1.6
Electricity, Gas and Water	-	2.2
<b>INDUSTRY</b>	<b>22.1</b>	<b>2.4</b>
Wholesale trade & retail	-	5.5
Other Services	-	3.7
Government services	-	-
<b>SERVICES</b>	<b>-</b>	<b>4.3</b>
<b>TOTAL</b>	<b>21.4</b>	<b>3.0</b>

Source: 1994 Social Accounting Matrix estimated by the author.

**Table 9: Sources of Income in 1994**

Income from:		Household Income Shares, base(%)												
		All	Urban Households						Rural Households					
			ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Labor	51.6	59.4	80.5	92.4	14.2	46.3	24.4	44.0	87.4	93.5	36.7	56.3	28.1	
Labor 1	1.7	0.0	4.6	0.9	0.0	0.9	0.2	0.0	20.0	4.7	0.0	0.0	1.8	
Labor 2	7.4	17.4	0.0	0.0	8.6	0.0	0.8	29.8	0.0	0.0	19.5	5.6	9.0	
Labor 3	35.1	0.0	75.9	91.5	0.0	45.4	23.4	0.0	67.4	88.8	0.0	50.7	11.6	
Labor 4	7.5	42.0	0.0	0.0	5.6	0.0	0.0	14.2	0.0	0.0	17.1	0.0	5.7	
Capital	33.0	26.6	6.0	7.3	69.5	24.8	66.7	31.3	6.9	5.1	46.2	36.0	58.9	
Capital Source 1 /a/	6.2	13.8	1.2	0.3	6.3	0.4	0.7	25.8	4.6	1.5	14.5	4.6	7.8	
Capital Source 2 /b/	11.2	3.3	1.1	0.8	23.3	7.0	41.3	2.0	0.5	0.9	15.4	11.9	33.1	
Capital Source 3 /c/	5.6	2.8	0.5	1.3	16.7	5.7	10.6	1.0	0.3	0.6	6.0	7.3	5.9	
Capital Source 4 /d/	9.9	6.7	3.1	4.8	23.2	11.7	14.1	2.5	1.5	2.2	10.4	12.2	12.1	
Others	15.4	14.0	13.5	0.3	16.2	28.9	8.9	24.7	5.7	1.4	17.1	7.7	12.9	
of which: dividends	6.7	0.0	12.3	0.0	3.2	25.4	2.3	0.0	1.3	0.0	0.0	0.0	0.0	
government transfers	5.6	12.3	1.1	0.3	5.6	0.3	0.7	23.2	4.1	1.3	13.0	3.9	7.0	
foreign income	3.1	1.7	0.2	0.1	7.4	3.1	5.9	1.6	0.2	0.0	4.2	3.8	5.9	
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Definition of Households												No. of Household		
												Nat'l survey	Total Phil.*	
Urban Households:														
Ur1: worked for private household and private establishment; zero education up to third year high school												2,718	1,174,931	
Ur2: worked for private household and private establishment; high school graduate and up												2,760	1,197,324	
Ur3: worked for government/ government corporation												1,396	583,777	
Ur4: self-employed without employee; zero education up to third year high school; including unemployed during 1994 survey.												4,323	1,829,586	
Ur5: self-employed without employee; high school graduate and up; including unemployed during 1994 survey.												2,818	1,218,175	
Ur6: employed in own family-operated farm or business; worked with pay in own family-operated farm or business; and worked without pay in own family-operated farm or business												817	343,500	
Total number of urban households												14,832	6,347,291	
Rural Households:														
Rur1: worked for private household and private establishment; zero education up to third year high school												1,814	1,170,044	
Rur2: worked for private household and private establishment; high school graduate and up												553	352,822	
Rur3: worked for government/ government corporation												454	288,582	
Rur4: self-employed without employee; zero education up to third year high school; including unemployed during 1994 survey												5,420	3,487,240	
Rur5: self-employed without employee; high school graduate and up; including unemployed during 1994 survey.												1,017	646,270	
Rur6: employed in own family-operated farm or business; worked with pay in own family-operated farm or business; and worked without pay in own family-operated farm or business												707	462,695	
Total number of rural households												9,965	6,407,653	
Total number of households												24,797	12,754,944	

Source: 1994 Family Income and Expenditure Survey

\*Derived using household adjustment factor in the Family Income and Expenditure Survey

/a/capital income derived from capital in agriculture, i.e.  $r_{ag} * K_{ag}$ , where  $K_{ag}$  capital in agriculture,  $r_{ag}$  price of capital in agriculture/b/capital income derived from capital in industry, i.e.  $r_{ind} * K_{ind}$ , where  $K_{ind}$  capital in industry,  $r_{ind}$  price of capital in industry/c/capital income derived from capital in wholesale and retail trade, i.e.  $r_{ag} * K_{ag}$ , where  $K_{ag}$  capital in trade,  $r_{tr}$  price of capital in trade/d/capital income derived from capital in other service, i.e.  $r_{ser} * K_{ser}$ , where  $K_{ser}$  capital in other service,  $r_{ser}$  price of capital in other service



**Table 10: Household Consumption Share, % (1994 Social Accounting Matrix)**

	Urban Households						Rural Households						Total	
	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6	Value (Pb)	Share
Crops	4.7	3.4	3.1	4.1	3.3	2.6	5.9	4.8	4.1	5.6	4.7	5.0	50.7	4.1
Livestock	4.0	2.9	2.6	3.5	2.8	2.2	5.0	4.0	3.5	4.8	3.9	4.2	43.0	3.5
Fishing	3.9	2.9	2.6	3.4	2.7	2.2	4.9	4.0	3.4	4.7	3.9	4.2	42.4	3.5
Other Agriculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>AGRICULTURE</b>	<b>12.6</b>	<b>9.2</b>	<b>8.3</b>	<b>10.9</b>	<b>8.8</b>	<b>7.0</b>	<b>15.8</b>	<b>12.8</b>	<b>11.0</b>	<b>15.1</b>	<b>12.5</b>	<b>13.4</b>	<b>136.1</b>	<b>11.1</b>
Mining	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.2	1.6	0.1
Food Manufacturing	35.4	24.3	22.1	29.4	22.8	18.8	46.3	37.0	31.2	42.5	35.1	37.9	374.2	30.6
Non-food Manufacturing	13.7	16.2	16.1	14.8	16.5	16.7	11.1	13.3	14.0	11.8	13.7	13.1	178.7	14.6
Construction	0.3	0.4	0.3	0.2	0.3	0.4	0.1	0.1	0.2	0.1	0.2	0.2	3.2	0.3
Electricity, Gas and Water	1.0	1.3	1.6	1.2	1.3	1.6	0.8	1.2	1.5	1.0	1.3	1.1	15.1	1.2
<b>INDUSTRY</b>	<b>50.5</b>	<b>42.3</b>	<b>40.2</b>	<b>45.9</b>	<b>41.1</b>	<b>37.6</b>	<b>58.5</b>	<b>51.7</b>	<b>47.0</b>	<b>55.5</b>	<b>50.4</b>	<b>52.5</b>	<b>572.9</b>	<b>46.8</b>
Wholesale trade & retail	12.0	17.1	14.2	13.4	17.6	17.6	5.6	7.3	6.6	6.1	7.5	7.4	153.1	12.5
Other Services	24.9	31.4	37.3	29.8	32.5	37.8	20.1	28.1	35.4	23.3	29.6	26.8	362.6	29.6
Government services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>SERVICES</b>	<b>36.9</b>	<b>48.5</b>	<b>51.5</b>	<b>43.2</b>	<b>50.1</b>	<b>55.3</b>	<b>25.7</b>	<b>35.4</b>	<b>42.0</b>	<b>29.4</b>	<b>37.1</b>	<b>34.2</b>	<b>515.8</b>	<b>42.1</b>
<b>TOTAL</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>1224.7</b>	<b>100.0</b>

Source: 1994 Social Accounting Matrix estimated by the author.

**Table 11: Distribution and Poverty**

	1985	1988	1991	1994	1997	2000
Gini Ratio	0.446		0.468	0.464	0.487	0.451
Poverty Incidence:						
Philippines	49.3	49.5	45.3	40.6	36.8	39.4
Urban	37.9	34.3	35.6	28.0	21.5	24.3
NCR	27.2	25.2	16.7	10.5	8.5	11.4
Rural	56.4	52.3	55.1	53.1	50.7	54.0

Source: National Statistical Coordination Board, and National Statistics Office.

NCR is National Capital Region

**Table 12: Base Values of Relevant Ratios**

	Export/Import Ratios (%)				Factor
	$\frac{pm_i \cdot m_i}{\sum_i pm_i \cdot m_i}$	$\frac{pm_i \cdot m_i}{pq_i \cdot q_i}$	$\frac{pe_i \cdot e_i}{\sum_i pe_i \cdot e_i}$	$\frac{pe_i \cdot e_i}{px_i \cdot x_i}$	Intensity
					ki/li
Crops	0.64	2.0	3.1	7.5	0.98
Livestock	0.54	2.6	0.0	0.1	0.99
Fishing	0.03	0.2	3.4	20.8	1.79
Other Agriculture	0.12	2.6	0.0	0.0	1.00
<b>AGRICULTURE</b>	<b>1.3</b>	<b>1.9</b>	<b>6.5</b>	<b>7.5</b>	
Mining	7.58	73.6	2.5	43.1	1.15
Food Manufacturing	6.17	8.2	8.6	9.7	1.74
Non-food Manufacturing	75.90	49.7	48.2	34.7	1.23
Construction	0.73	2.6	0.3	0.8	1.28
Electricity, Gas and Water	0.00	0.0	0.2	1.2	2.97
<b>INDUSTRY</b>	<b>90.4</b>	<b>32.3</b>	<b>59.7</b>	<b>21.2</b>	
Wholesale trade & retail	0.00	0.0	14.3	20.9	1.95
Other Services	8.29	7.8	19.5	14.6	1.64
Government services					
<b>SERVICES</b>	<b>8.3</b>	<b>5.4</b>	<b>33.8</b>	<b>14.3</b>	
<b>TOTAL</b>	<b>100.0</b>	<b>19.9</b>	<b>100.0</b>	<b>16.5</b>	

where

$m_i$  : imports

$e_i$  : exports

$d_i$  : domestic sales

$q_i$  : composite commodity

$x_i$  : total output

$pm_i$  : import (local) prices

$pe_i$  : export (local) prices

$pd_i$  : domestic prices

$pq_i$  : composite commodity prices

$px_i$  : output prices

**Table 13: Base Values of Relevant Macro Variables**

	<b>Base Values</b>
Government Balance	40.6
Nominal Government Income ( <b>fixed</b> )	322.3
of which :   Tariff Revenue	102.7
Indirect Tax Revenue	87.8
Direct Tax Revenue	128.0
Others ( <b>fixed</b> )	3.9
Total Real Government Consumption ( <b>fixed</b> )	183.4
Total Nominal Government Consumption	183.4
Price Index Total Government Consumption	1.00
Total Real Investment ( <b>fixed</b> )	116.3
Total Nominal Investment	428.9
Price Index of Total Investment	3.69
Balance of Trade	5.4
Current Account Balance ( <b>fixed</b> )	99.9

Table 14: 100%tariff reduction, indirect tax, base elasticities

	Trade Elasticities		Tariff Rates		Sectoral Shares (%)					Price Changes (%)				Volume Changes (%)				
					$pva_i^*va_i/$	$pm_i^*m_i/$	$pe_i^*e_i/$	$pm_i^*m_i/$	$pe_i^*e_i/$	$\delta pm_i$	$\delta pd_i$	$\delta pq_i$	$\delta(p_e/pl)_i$	$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$
	Armington	CET	$tm_0$	$\delta tm_i$ (%)	$\Sigma pva_i^*va_i$	$\Sigma pm_i^*m_i$	$\Sigma pe_i^*e_i$	$pq_i^*q_i$	$px_i^*x_i$									
Crops	1.95	1.27	14.9	-100.0	10.1	0.7	2.9	2.2	8.1	-10.7	-1.2	-1.4	3.8	20.0	3.3	-1.5	-1.1	-1.1
Livestock	1.40	0.40	0.6	-100.0	4.3	0.6	0.0	2.6	0.1	1.7	-0.7	-0.6	3.1	-5.2	-0.8	-2.0	-2.0	-2.0
Fishing	1.10	1.50	31.9	-100.0	3.8	0.0	3.2	0.3	22.3	-21.3	0.3	0.2	3.5	29.1	4.2	-1.1	-1.1	0.0
Other Agriculture	0.85	0.40	0.3	-100.0	1.4	0.1	0.0	2.6	0.0	2.7	1.0	1.1		-0.7		0.7	0.6	0.7
<b>AGRICULTURE</b>			<b>7.6</b>	<b>-100.0</b>	<b>19.6</b>	<b>1.5</b>	<b>6.2</b>	<b>2.0</b>	<b>8.1</b>	<b>-4.7</b>	<b>-0.7</b>	<b>-0.8</b>		<b>8.1</b>	<b>3.7</b>	<b>-1.4</b>	<b>-1.3</b>	<b>-1.0</b>
Mining	1.10	1.50	40.9	-100.0	0.9	6.6	2.4	72.8	50.6	-27.9	-10.1	-23.6	13.0	12.2	5.8	-12.0	5.2	-4.1
Food Manufacturing	1.08	1.20	33.7	-100.0	8.3	6.7	8.0	8.8	10.3	-21.6	1.5	-0.7	3.3	28.8	1.3	-2.5	-0.2	-2.1
Non-food Manufacturing	0.92	1.37	19.5	-100.0	15.0	75.7	50.7	49.0	39.6	-14.5	-6.6	-10.6	9.3	9.1	13.6	0.6	4.7	5.2
Construction	1.20	1.20	0.0	-	5.3	0.7	0.3	2.5	0.9	2.1	-3.6	-3.5	5.9	-8.2	5.5	-1.6	-1.8	-1.6
Electricity, Gas and Water	1.20	1.20	0.0	-	2.9	0.0	0.2	0.0	1.3	0.0	-1.3	-1.3	4.2		5.6	0.5	0.5	0.6
<b>INDUSTRY</b>			<b>21.9</b>	<b>-100.0</b>	<b>32.5</b>	<b>89.7</b>	<b>61.6</b>	<b>31.7</b>	<b>24.3</b>	<b>-16.0</b>	<b>-2.9</b>	<b>-7.3</b>		<b>10.6</b>	<b>11.5</b>	<b>-1.1</b>	<b>2.5</b>	<b>1.7</b>
Wholesale trade & retail	1.20	1.20	0.0	-	13.7	0.0	13.6	0.0	22.5	0.0	2.5	2.5	4.4		2.7	-2.4	-2.4	-1.3
Other Services	1.20	1.20	0.0	-	26.5	8.9	18.7	8.2	15.6	4.8	1.3	1.5	3.5	-4.8	3.4	-0.8	-1.1	-0.2
Government services	-	-			7.7	0.0	0.0	0.0	0.0	0.0								0.0
<b>SERVICES</b>					<b>47.9</b>	<b>8.9</b>	<b>32.2</b>	<b>5.7</b>	<b>15.3</b>	<b>4.8</b>	<b>1.7</b>	<b>1.8</b>		<b>-4.8</b>	<b>3.1</b>	<b>-1.3</b>	<b>-1.5</b>	<b>-0.5</b>
<b>TOTAL</b>			<b>19.4</b>	<b>-100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>19.6</b>	<b>18.5</b>	<b>-13.6</b>	<b>-2.1</b>	<b>-3.4</b>		<b>9.3</b>	<b>8.1</b>	<b>-1.2</b>	<b>0.7</b>	<b>0.4</b>

where

 $m_i$  : imports $pm_i$  : import (local) prices $q_i$  : composite commodity $pq_i$  : composite commodity prices $e_i$  : exports $pe_i$  : export (local) prices $va_i$  : value added $pva_i$  : value added prices $d_i$  : domestic sales $pd_i$  : domestic prices $x_i$  : total output $px_i$  : output prices $pl_i$  : local prices

**Table 15: 100% tariff reduction, indirect tax, base elasticities**

	Value Added Changes (%)		Factor Intensity $k_i/l_i$	Sectoral Shares(%)		Return to Capital (%) $\delta r_i$	Change in Labor Demand, %				
	$\delta pva_i$	$\delta va_i$		$w_i \cdot l_i / \sum_i w_i \cdot l_i$	$r k_i \cdot k_i / \sum_i r_i \cdot k_i$		Aggregate	L1*	L2*	L3*	L4*
Crops	-3.4	-1.1	1.00	11.4	9.1	-4.5	-2.2	-0.2	-0.2	-2.3	-4.5
Livestock	-4.2	-2.0	1.02	4.9	3.9	-6.0	-3.7	-1.8	-1.8	-3.9	-6.0
Fishing	-2.3	0.0	1.80	3.0	4.4	-2.3	0.0	2.1	2.1	-0.1	-2.3
Other Agriculture	-1.6	0.7	0.98	1.6	1.3	-1.0	1.8	3.5	3.5	1.3	-1.0
<b>AGRICULTURE</b>	<b>-3.2</b>	<b>-1.0</b>		<b>20.8</b>	<b>18.7</b>	<b>-4.1</b>	<b>-2.0</b>	<b>0.0</b>	<b>0.0</b>	<b>-2.0</b>	<b>-4.2</b>
Mining	-6.8	-4.1	1.27	1.0	0.9	-10.6	-9.0			-8.6	-10.6
Food Manufacturing	-5.9	-2.1	1.84	6.8	9.6	-7.9	-5.6			-5.8	-7.9
Non-food Manufacturing	4.1	5.2	1.10	14.9	15.1	9.5	12.1			12.0	9.5
Construction	-4.2	-1.6	1.33	5.2	5.5	-5.7	-3.5			-3.6	-5.8
Electricity, Gas and Water	-0.7	0.6	2.89	1.6	3.9	-0.1	2.6			2.2	-0.1
<b>INDUSTRY</b>	<b>-0.9</b>	<b>1.3</b>		<b>29.5</b>	<b>35.0</b>	<b>0.1</b>	<b>3.4</b>			<b>3.1</b>	<b>1.3</b>
Wholesale trade & retail	-4.8	-1.3	2.02	10.3	16.4	-6.1	-3.9			-3.9	-6.1
Other Services	-2.5	-0.2	1.65	22.3	29.9	-2.7	-0.4			-0.5	-2.7
Government services	-2.3			17.1	0.0		0.0			0.0	0.0
<b>SERVICES</b>	<b>-3.3</b>	<b>-0.6</b>		<b>49.7</b>	<b>46.4</b>		<b>-1.0</b>			<b>-1.1</b>	<b>-2.9</b>
<b>TOTAL</b>	<b>-2.5</b>	<b>0.0</b>		<b>100.0</b>	<b>100.0</b>	<b>-2.6</b>				<b>0.0</b>	<b>0.0</b>
<b>Average Wage</b>							<b>-2.0</b>	<b>-4.0</b>	<b>-4.0</b>	<b>-2.0</b>	<b>0.0</b>

where

$va_i$  : value added

$k_i$  : capital

$l_i$  : labor

$pva_i$  : value added prices

$r_i$  : price of capital

$w_i$  : price of labor

\*L1, L2, L3, & L4: Labor type 1, 2, 3, & 4

Table 16: 100% tariff reduction, indirect tax, base elasticities

	Share	Initial	Simulated	Prices		Percentage change (%) of Consumption shares (simulated vs base)											
	$\frac{pm_i \cdot m_i}{pq_i \cdot q_i}$	Indirect	Indirect	Changes (%)		Urban Households						Rural Households					
		Tax Rate	Tax Rate*	$\delta pm_i$	$\delta pd_i$	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Crops	2.2	1.9	4.5	-10.7	-1.2	3.9	3.4	5.6	2.4	3.2	5.8	2.1	2.5	1.1	2.3	3.1	1.0
Livestock	2.6	1.8	4.2	1.7	-0.7	1.7	3.7	2.0	2.4	1.6	6.8	2.1	2.5	1.1	2.3	3.1	7.8
Fishing	0.3	2.9	6.9	-21.3	0.3	1.7	1.8	-2.2	0.5	1.6	0.5	2.1	2.5	1.1	1.1	-1.8	1.0
Other Agriculture	2.6	2.3	5.3	2.7	1.0												
<b>AGRICULTURE</b>	<b>2.0</b>	<b>2.1</b>	<b>4.8</b>	<b>-4.7</b>	<b>-0.7</b>	2.5	3.0	2.0	1.8	2.2	4.5	2.1	2.5	1.1	2.0	1.5	3.1
Mining	72.8	1.3	2.9	-27.9	-10.1	1.7	1.8	2.0	2.4	1.6		2.1			2.3	3.1	
Food Manufacturing	8.8	3.7	8.7	-21.6	1.5	2.0	2.3	2.0	2.2	2.3	2.8	1.0	2.5	1.1	1.6	3.1	1.8
Non-food Manufacturing	49.0	1.6	3.8	-14.5	-6.6	13.1	13.8	14.0	13.8	13.9	14.0	11.3	13.9	13.4	12.9	13.7	12.5
Construction	2.5	1.6	3.8	2.1	-3.6	1.7	1.8	2.0	2.4	1.6	0.5	2.1		1.1	2.3	3.1	1.0
Electricity, Gas and Water	0.0	2.2	5.2		-1.3	1.7	6.2	2.0	2.4	5.5	9.7	2.1	2.5	1.1	2.3	3.1	1.0
<b>INDUSTRY</b>	<b>31.7</b>	<b>2.4</b>	<b>5.6</b>	<b>-16.0</b>	<b>-2.9</b>	4.9	6.7	6.7	5.8	6.9	8.3	2.9	5.4	4.6	4.0	5.9	4.9
Wholesale trade & retail	0.0	5.5	12.9		2.5	-1.0	-0.9	-0.4	-1.0	-0.8	-1.1	-0.9	-2.4	1.1	-1.4	-2.2	-2.9
Other Services	8.2	3.7	8.7	4.8	1.3	-0.4	0.1	-0.1	0.2	0.3	0.2	-1.2	0.0	-0.7	-0.5	0.4	0.0
Government services																	
<b>SERVICES</b>	<b>5.7</b>	<b>4.3</b>	<b>10.0</b>	<b>4.8</b>	<b>1.7</b>	-0.6	-0.2	-0.2	-0.2	-0.1	-0.2	-1.1	-0.5	-0.5	-0.7	-0.1	-0.6
<b>TOTAL</b>	<b>19.6</b>	<b>3.0</b>	<b>7.1</b>	<b>-13.6</b>	<b>-2.1</b>												

where

$m_i$  : imports

$pm_i$  : import (local) prices

$q_i$  : composite commodity  $pq_i$  : composite commodity price

$d_i$  : domestic sales

$pd_i$  : domestic prices

\*indirect tax<sub>td</sub>  $\times$  (1+ntaxr) where ntaxr is compensatory indirect tax

Table 17: 100% tariff reduction, indirect tax, base elasticities

Income from:	Household Income Shares, simulated(%)												
	All	Urban Households						Rural Housholds					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Labor	51.6	59.9	80.3	92.4	14.2	46.1	24.2	44.2	87.5	93.6	36.7	56.3	28.0
Capital	32.9	26.3	5.9	7.2	69.4	24.6	66.7	31.1	6.8	5.1	46.2	35.9	59.0
Others	15.5	13.8	13.8	0.3	16.4	29.4	9.1	24.7	5.8	1.3	17.1	7.8	13.0
of which: dividends	6.9	0.0	12.5	0.0	3.3	25.9	2.4	0.0	1.5	0.0	0.0	0.0	0.0
government transfers	5.5	12.1	1.1	0.3	5.5	0.3	0.7	23.1	4.1	1.3	12.8	4.0	6.9
foreign income	3.1	1.8	0.2	0.1	7.6	3.2	6.0	1.6	0.2	0.0	4.3	3.9	6.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Income from:	Income Change, relative to base (%)												
	Change	Urban Households						Rural Housholds					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Labor	-2.3	-1.3	-2.4	-2.3	-2.7	-2.2	-2.2	-2.8	-2.6	-2.4	-2.3	-2.3	-2.4
Capital	-2.6	-3.3	-2.9	-2.4	-2.7	-2.7	-1.6	-3.9	-4.2	-4.8	-2.6	-2.7	-1.9
Others	-1.3	-3.1	-0.3	0.0	-1.3	-0.1	0.0	-3.3	0.0	0.0	-2.8	0.0	-1.7
of which: dividends	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
government transfers	-3.5	-3.6	-4.0	0.0	-3.8	-12.5	0.0	-3.6	0.0	0.0	-3.7	0.0	-3.2
foreign income													
Total	-2.2	-2.1	-2.1	-2.3	-2.5	-1.7	-1.6	-3.3	-2.6	-2.5	-2.5	-2.3	-2.0
Change in Direct Taxes (%)	-2.1	0.0	-1.6	-3.4	-1.9	-1.6	-1.9	0.0	-6.3	-4.5	-2.9	0.0	-4.5
Change in Net Income (%)	-2.2	-2.2	-2.1	-2.3	-2.5	-1.7	-1.6	-3.3	-2.7	-2.4	-2.5	-2.5	-1.9

**Table 18: 100% tariff reduction, indirect tax, base elasticities**

	All	Urban Households						Rural Housholds					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Change in nominal Income (%)	-2.23	-2.10	-2.11	-2.30	-2.49	-1.74	-1.62	-3.29	-2.57	-2.49	-2.53	-2.25	-2.03
Change in prices (%) /a/	-1.06	-1.04	-1.04	-1.00	-1.08	-1.12	-1.07	-0.99	-0.96	-1.06	-1.11	-1.09	-1.25
Welfare change /b/	1.96	1.98	2.25	1.79	1.61	2.56	3.33	0.73	1.43	2.44	1.21	1.73	2.74

/a/ change in sectoral composite price ( $p_{q_i}$ ) x base consumption shares<sub>h</sub> in Table 10

/b/ see welfare equation in the text

**Table 19: 100% tariff reduction, indirect tax, base elasticities**

	Base Values*	Simulated Values	Difference
Government Balance	40.6	47.9	7.3
Nominal Government Income ( <b>fixed</b> )	322.3	322.3	0
of which : Tariff Revenue	102.7	0	-102.7
Indirect Tax Revenue	87.8	193.5	105.7
Direct Tax Revenue	128	125	-3
Others ( <b>fixed</b> )	3.9	3.9	0
Total Real Government Consumption ( <b>fixed</b> )	183.4	183.4	0
Total Nominal Government Consumption	183.4	179.1	-4.3
Price Index Total Government Consumption	10	9.8	-0.2
Total Real Investment ( <b>fixed</b> )	116.3	116.3	0
Total Nominal Investment	428.9	405.2	-23.7
Price Index of Total Investment	36.9	34.9	-2
Balance of Trade	5.4	2.2	-3.2
Current Account Balance ( <b>fixed</b> )	99.9	99.9	0

Billion pesos for values and % for price index



**Table 20: Household Income (base)**

	<b>Household Income (P'000)*</b>	<b>Number of households**</b>	<b>Income per Household (P)</b>	<b>Rank</b>
<b>ur1</b>	114,270,501	1,174,931	97,257	6
<b>ur2</b>	232,349,268	1,197,324	194,057	2
<b>ur3</b>	113,062,452	583,777	193,674	3
<b>ur4</b>	184,831,559	1,829,586	101,024	5
<b>ur5</b>	235,323,161	1,218,175	193,177	4
<b>ur6</b>	92,450,811	343,500	269,144	1
<b>average income per household</b>			<b>153,182</b>	
<b>rur1</b>	73,108,999	1,170,044	62,484	5
<b>rur2</b>	34,988,328	352,822	99,167	2
<b>rur3</b>	40,091,092	288,582	138,924	1
<b>rur4</b>	209,275,241	3,487,240	60,012	6
<b>rur5</b>	62,202,750	646,270	96,249	3
<b>rur6</b>	44,397,734	462,695	95,955	4
<b>average income per household</b>			<b>72,423</b>	
<b>overall average</b>	<b>1,436,351,896</b>	<b>12,754,944</b>	<b>112,611</b>	

\* 1994 Social Accounting Matrix

\*\* FIES, national adjusted

Table 21: Actual tariff change, direct tax, base elasticities

	Trade Elasticities		Tariff Rates		Sectoral Shares (%)					Price Changes (%)				Volume Changes (%)				
					$pva_i \cdot va_i /$	$pm_i \cdot m_i /$	$pe_i \cdot e_i /$	$pm_i \cdot m_i /$	$pe_i \cdot e_i /$									
	Armington	CET	$tm_0$	$\delta tm_i$ (%)	$\Sigma pva_i \cdot va_i$	$\Sigma pm_i \cdot m_i$	$\Sigma pe_i \cdot e_i$	$pq_i \cdot q_i$	$px_i \cdot x_i$					$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$
Crops	1.95	1.27	14.9	-45.6	10.1	0.7	2.9	2.1	7.7	-5.9	-0.9	-1.0	0.8	9.4	-0.2	-1.2	-1.0	-1.2
Livestock	1.40	0.40	0.6	-57.6	4.4	0.6	0.0	2.6	0.1	-0.4	-1.4	-1.4	1.4	-3.2	-1.1	-1.7	-1.7	-1.7
Fishing	1.10	1.50	31.9	-76.4	3.7	0.0	3.2	0.3	21.5	-18.5	-1.5	-1.6	1.5	21.8	1.2	-1.1	-1.0	-0.6
Other Agriculture	0.85	0.40	0.3	-19.9	1.4	0.1	0.0	2.9	0.0	-0.1	0.5	0.5		0.8		0.4	0.4	0.4
<b>AGRICULTURE</b>			<b>7.6</b>	<b>-48.9</b>	<b>19.6</b>	<b>1.4</b>	<b>6.2</b>	<b>2.0</b>	<b>7.7</b>	<b>-3.3</b>	<b>-1.0</b>	<b>-1.1</b>		<b>3.7</b>	<b>0.5</b>	<b>-1.2</b>	<b>-1.2</b>	<b>-1.1</b>
Mining	1.10	1.50	40.9	-88.9	0.9	6.6	2.4	74.3	49.3	-25.8	-9.3	-21.8	10.3	10.4	2.6	-11.5	4.2	-5.2
Food Manufacturing	1.08	1.20	33.7	-55.4	8.6	6.4	8.2	8.5	10.0	-14.0	-1.8	-2.9	1.8	13.9	1.0	-1.2	0.0	-1.0
Non-food Manufacturing	0.92	1.37	19.5	-64.0	14.7	76.2	50.4	50.3	38.2	-10.4	-6.2	-8.3	6.6	5.3	10.2	0.9	3.1	4.2
Construction	1.20	1.20	0.0	-	5.4	0.7	0.3	2.6	0.9	0.0	-3.5	-3.4	3.6	-5.5	2.9	-1.4	-1.5	-1.4
Electricity, Gas and Water	1.20	1.20	0.0	-	2.8	0.0	0.2	0.0	1.3	0.0	-2.1	-2.1	2.1		2.8	0.3	0.3	0.3
<b>INDUSTRY</b>			<b>21.9</b>	<b>-65.3</b>	<b>32.4</b>	<b>89.9</b>	<b>61.5</b>	<b>32.3</b>	<b>23.3</b>	<b>-11.9</b>	<b>-4.0</b>	<b>-6.6</b>		<b>6.2</b>	<b>8.5</b>	<b>-0.4</b>	<b>1.7</b>	<b>1.5</b>
Wholesale trade & retail	1.20	1.20	0.0	-	14.0	0.0	13.6	0.0	21.3	0.0	-1.2	-1.2	1.2		0.5	-0.9	-0.9	-0.6
Other Services	1.20	1.20	0.0	-	26.4	8.6	18.7	8.0	15.0	0.0	-1.4	-1.3	1.4	-2.2	1.2	-0.5	-0.7	-0.3
Government services	-	-			7.7	0.0	0.0	0.0	0.0	0.0								0.0
<b>SERVICES</b>					<b>48.1</b>	<b>8.6</b>	<b>32.4</b>	<b>5.5</b>	<b>14.6</b>	<b>0.0</b>	<b>-1.3</b>	<b>-1.3</b>		<b>-2.2</b>	<b>0.9</b>	<b>-0.7</b>	<b>-0.7</b>	<b>-0.3</b>
<b>TOTAL</b>			<b>19.4</b>	<b>-65.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>19.8</b>	<b>17.7</b>	<b>-10.4</b>	<b>-3.2</b>	<b>-4.0</b>		<b>5.5</b>	<b>5.4</b>	<b>-0.6</b>	<b>0.5</b>	<b>0.4</b>

where

 $m_i$  : imports $pm_i$  : import (local) prices $q_i$  : composite commodity $pq_i$  : composite commodity prices $e_i$  : exports $pe_i$  : export (local) prices $va_i$  : value added $pva_i$  : value added prices $d_i$  : domestic sales $pd_i$  : domestic prices $x_i$  : total output $px_i$  : output prices $pl_i$  : local prices

Table 22: Actual tariff change, direct tax, base elasticities

	Value Added		Factor	Sectoral Shares(%)		Return to	Change in Labor Demand, %				
	Changes (%)			Intensity	$w_i \cdot l_i /$		$r k_i \cdot k_i /$	Capital (%)	Aggregate	L1*	L2*
	$\delta p v a_i$	$\delta v a_i$	$k_i / l_i$		$\Sigma_i w \cdot l_i$	$\Sigma_i r_i \cdot k_i$	$\delta r_i$				
Crops	-0.1	-1.2	1.00	11.4	9.1	-1.2	-2.3	0.0	0.0	-2.4	-4.1
Livestock	-0.6	-1.7	1.02	4.9	3.9	-2.3	-3.2	-1.2	-1.2	-3.5	-5.2
Fishing	0.0	-0.6	1.82	2.9	4.3	-0.6	-1.4	0.6	0.6	-1.8	-3.5
Other Agriculture	1.4	0.4	0.99	1.6	1.3	1.8	0.9	3.0	3.0	0.6	-1.2
AGRICULTURE	-0.1	-1.1		20.8	18.6	-1.1	-2.2	0.0	0.0	-2.3	-4.2
Mining	-5.0	-5.2	1.30	0.9	0.9	-9.9	-11.5			-11.1	-12.6
Food Manufacturing	-0.7	-1.0	1.79	7.0	9.9	-1.6	-2.6			-2.8	-4.6
Non-food Manufacturing	6.3	4.2	1.13	14.6	14.7	10.7	9.6			9.4	7.5
Construction	-0.7	-1.4	1.32	5.2	5.5	-2.1	-3.0			-3.3	-5.0
Electricity, Gas and Water	2.0	0.3	2.94	1.6	3.9	2.4	0.9			1.1	-0.6
INDUSTRY	2.4	1.1		29.4	34.9	3.4	2.9			2.5	1.2
Wholesale trade & retail	-0.2	-0.6	1.98	10.6	16.8	-0.8	-1.8			-2.0	-3.7
Other Services	0.6	-0.3	1.65	22.2	29.8	0.4	-0.7			-0.9	-2.6
Government services	1.1			17.1	0.0		0.0			-0.2	0.0
SERVICES	0.3	-0.4		49.9	46.5		-0.7			-0.9	-2.7
TOTAL	1.0	0.0		100.0	100.0	0.9				0.0	0.0
Average Wage							1.0	-1.0	-1.0	1.0	3.0

where

$va_i$  : value added

$k_i$  : capital

$l_i$  : labor

$pva_i$  : value added prices

$r_i$  : price of capital

$w_i$  : price of labor

\*L1, L2, L3, & L4: Labor type 1, 2, 3, & 4

Table 23: actual tariff change, direct tax, base elasticities

	Share	Initial	Simulated	Prices		Percentage change (%) of Consumption shares (simulated vs base)											
	$pm_i^*m_i/pq_i^*q_i$	Indirect	Indirect	Changes (%)		Urban Households						Rural Housholds					
		Tax Rate	Tax Rate*	$\delta pm_i$	$\delta pd_i$	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Crops	2.1	1.9	1.9	-5.9	-0.9	-1.2	1.2	0.9	-0.1	1.0	-0.5	0.4	0.6	0.0	-0.7	-2.0	0.0
Livestock	2.6	1.8	1.8	-0.4	-1.4	1.0	1.2	0.9	-0.4	1.0	-0.5	-0.1	0.6	0.0	-0.1	2.0	0.0
Fishing	0.3	2.9	2.9	-18.5	-1.5	1.0	1.2	-3.3	-0.4	-0.9	-0.5	-0.2	0.6	0.0	-0.1	-2.8	0.0
Other Agriculture	2.9	2.3	2.3	-0.1	0.5												
<b>AGRICULTURE</b>	<b>2.0</b>	<b>2.1</b>	<b>2.1</b>	<b>-3.3</b>	<b>-1.0</b>	0.2	1.2	-0.4	-0.3	0.4	-0.5	0.1	0.6	0.0	-0.3	-1.0	0.0
Mining	74.3	1.3	1.3	-25.8	-9.3	1.0	1.2	0.9	1.4	1.0		3.1			2.2	2.0	
Food Manufacturing	8.5	3.7	3.7	-14.0	-1.8	1.3	1.6	1.4	1.7	1.5	1.7	1.7	0.6	1.0	1.5	2.6	1.5
Non-food Manufacturing	50.3	1.6	1.6	-10.4	-6.2	7.5	7.9	7.6	7.5	7.8	8.4	7.8	6.2	7.3	7.7	8.0	6.8
Construction	2.6	1.6	1.6	0.0	-3.5	1.0	1.2	0.9	1.4	1.0	-0.5	3.1		0.0	2.2	2.0	0.0
Electricity, Gas and Water	0.0	2.2	2.2		-2.1	1.0	1.2	0.9	1.4	1.0	8.5	3.1	-24.5	0.0	2.2	2.0	0.0
<b>INDUSTRY</b>	<b>32.3</b>	<b>2.4</b>	<b>2.4</b>	<b>-11.9</b>	<b>-4.0</b>	2.9	3.9	3.8	3.5	4.0	5.3	2.8	1.3	2.8	2.8	4.0	3.3
Wholesale trade & retail	0.0	5.5	5.5		-1.2	0.1	-0.2	0.1	0.0	-0.2	0.3	0.2	0.6	0.0	0.3	-0.6	0.0
Other Services	8.0	3.7	3.7	0.0	-1.4	-0.2	-0.1	0.0	0.1	0.1	-0.2	-0.1	-0.6	0.0	0.1	0.7	0.0
Government services																	
<b>SERVICES</b>	<b>5.5</b>	<b>4.3</b>	<b>4.3</b>	<b>0.0</b>	<b>-1.3</b>	-0.1	-0.1	0.0	0.1	0.0	0.0	-0.1	-0.4	0.0	0.1	0.5	0.0
<b>TOTAL</b>	<b>19.8</b>	<b>3.0</b>	<b>3.0</b>	<b>-10.4</b>	<b>-3.2</b>												

where

 $m_i$  : imports $pm_i$  : import (local) prices $q_i$  : composite commodity $pq_i$  : composite commodity prices $d_i$  : domestic sales $pd_i$  : domestic prices\*indirect tax<sub>td</sub> × (1+ntaxr) wherentaxr is compensatory indirect tax

Table 24: actual tariff change, direct tax, base elasticities

Income from:	Household Income Shares, simulated(%)												
	All	Urban Households						Rural Households					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Labor	51.9	60.2	80.7	92.5	14.3	46.5	24.3	44.6	87.6	93.6	36.9	56.5	28.1
Capital	33.1	26.4	5.9	7.2	69.8	24.8	66.9	31.4	6.8	5.2	46.5	36.1	59.3
Others	15.1	13.4	13.4	0.3	15.9	28.7	8.8	24.0	5.6	1.3	16.6	7.4	12.6
of which: dividends	6.7	0.0	12.2	0.0	3.2	25.3	2.3	0.0	1.4	0.0	0.0	0.0	0.0
government transfers	5.3	11.7	1.0	0.3	5.4	0.3	0.6	22.4	4.0	1.2	12.4	3.7	6.7
foreign income	3.0	1.7	0.2	0.1	7.4	3.1	5.8	1.6	0.2	0.0	4.2	3.7	5.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Income from:	Income Change, relative to base (%)												
	Change	Urban Households						Rural Households					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Labor	1.1	1.8	1.1	1.1	0.8	1.2	1.3	0.3	0.7	1.1	0.8	1.1	0.8
Capital	0.8	-0.3	0.7	0.0	0.9	0.9	1.9	-0.9	0.0	0.0	0.7	0.9	1.5
Others	-1.5	-3.8	-0.3	0.0	-1.3	-0.1	0.0	-3.9	0.0	0.0	-3.3	-2.1	-1.7
of which: dividends	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
government transfers	-4.1	-4.3	-4.0	0.0	-3.8	-12.5	0.0	-4.1	0.0	0.0	-4.4	-4.2	-3.2
foreign income													
Total	0.6	0.4	0.9	1.1	0.5	0.7	1.6	-1.1	0.6	1.0	0.0	0.8	0.9
Change in Direct Taxes (%)	93.9	168.8	44.3	61.4	161.1	91.1	84.6	425.0	100.0	86.4	277.1	161.1	95.5
Change in Net Income (%)	-4.4	-4.4	-4.4	-4.0	-4.3	-4.2	-3.4	-5.8	-4.5	-4.0	-4.7	-4.1	-4.0

**Table 25: actual tariff change, direct tax, base elasticities**

	All	Urban Households						Rural Households					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Change in nominal Income (%)	0.61	0.44	0.86	1.06	0.54	0.72	1.62	-1.10	0.57	1.00	0.05	0.80	0.90
Change in prices (%) /a/	-2.80	-2.77	-2.77	-2.77	-2.82	-2.81	-2.81	-2.79	-2.71	-2.80	-2.83	-2.79	-2.87
Welfare change /b/	3.22	3.10	3.36	3.60	3.12	3.53	5.15	1.44	2.95	4.25	2.30	3.38	3.96

/a/ change in sectoral composite price ( $p_{qi}$ ) x base consumption shares<sub>h</sub> in Table 10

/b/ see welfare equation in the text

**Table 26: Actual tariff change, direct tax, base elasticities**

	Base Values*	Simulated Values	Difference
Government Balance	4.06	4.5	0.4
Nominal Government Income ( <b>fixed</b> )	32.2	32.2	0.0
of which : Tariff Revenue	10.3	3.7	-6.6
Indirect Tax Revenue	8.8	8.5	-0.3
Direct Tax Revenue	12.8	19.7	6.9
Others ( <b>fixed</b> )	0.4	0.4	0.0
Total Real Government Consumption ( <b>fixed</b> )	18.3	18.3	0.0
Total Nominal Government Consumption	18.3	18.3	-0.1
Price Index Total Government Consumption	1.00	1.00	0.00
Total Real Investment ( <b>fixed</b> )	11.6	11.6	0.0
Total Nominal Investment	42.9	40.7	-2.2
Price Index of Total Investment	3.69	3.50	-0.2
Balance of Trade	0.5	0.7	0.1
Current Account Balance ( <b>fixed</b> )	10.0	10.0	0.0

\* Billion pesos and precentage for price index

**Table 27: Philippine Unemployed Rate (%)**

<b>E d u c a t i o n a l L e v e l</b>	<b>1 9 9 0</b>	<b>1 9 9 5</b>	<b>2 0 0 0</b>
No Grade Completed	6.36	5.82	7.69
Elementary	5.06	5.32	6.51
1st to 5th Grade	4.80	5.20	6.00
Graduate	5.30	5.43	6.97
High School	10.11	9.95	11.82
1st to 3rd Year	8.94	8.65	10.81
Graduate	10.94	10.81	12.38
College	11.66	11.76	13.16
Undergraduate	12.84	13.29	13.91
Graduate	10.74	10.20	12.46
Not Reported	36.00	24.14	25.68
<b>O v e r a l l</b>	<b>8.13</b>	<b>8.36</b>	<b>10.14</b>
Unskilled*	5.97	6.12	7.62
Skilled**	11.39	11.36	12.91

\* No grade completed up to third year high school

\*\* High school graduate and up

Source: LFS, NSO, various years

**Table 28: Actual Tariff, direct tax, base elasticities: Price and Volume changes (with wage curve analysis)**

	Price Changes (%)				Volume Changes (%)				
	$\delta p_{mi}$	$\delta p_{di}$	$\delta p_{qi}$	$\delta (p_e/p_l)_i$	$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$
Crops	-5.9	-0.8	-1.0	0.9	9.4	-0.1	-1.2	-1.0	-1.1
Livestock	-0.3	-1.4	-1.4	1.4	-3.2	-1.1	-1.7	-1.7	-1.7
Fishing	-18.5	-1.5	-1.6	1.5	21.8	1.2	-1.1	-1.0	-0.6
Other Agriculture	0.0	0.6	0.5		0.8		0.4	0.4	0.4
<b>AGRICULTURE</b>	<b>-3.1</b>	<b>-1.0</b>	<b>-1.1</b>		<b>3.3</b>	<b>0.6</b>	<b>-1.2</b>	<b>-1.1</b>	<b>-1.1</b>
Mining	-25.9	-9.3	-21.8	10.4	10.4	2.6	-11.5	4.2	-5.2
Food Manufacturing	-13.9	-1.8	-2.8	1.8	13.9	1.0	-1.2	0.0	-1.0
Non-food Manufacturing	-10.5	-6.2	-8.3	6.6	5.3	10.2	0.9	3.1	4.2
Construction	0.0	-3.4	-3.3	3.6	-5.5	2.9	-1.4	-1.5	-1.4
Electricity, Gas and Water		-2.1	-2.1	2.1		2.8	0.3	0.3	0.3
<b>INDUSTRY</b>	<b>-9.8</b>	<b>-3.8</b>	<b>-5.7</b>		<b>5.3</b>	<b>8.4</b>	<b>-0.2</b>	<b>1.5</b>	<b>1.6</b>
Wholesale trade & retail		-1.2	-1.2	1.2		0.5	-0.9	-0.9	-0.6
Other Services	0.0	-1.4	-1.3	1.4	-2.2	1.2	-0.5	-0.6	-0.3
Government services									0.0
<b>SERVICES</b>	<b>0.0</b>	<b>-1.3</b>	<b>-1.2</b>		<b>-2.2</b>	<b>0.9</b>	<b>-0.6</b>	<b>-0.7</b>	<b>-0.3</b>
<b>TOTAL</b>	<b>-10.4</b>	<b>-2.5</b>	<b>-4.0</b>		<b>5.2</b>	<b>5.4</b>	<b>-0.6</b>	<b>0.5</b>	<b>0.4</b>



**Table 29: Actual Tariff, direct tax, base elasticities: Changes in Factors (with wage curve analysis)**

	Value Added Changes (%)		Return to Capital (%)	Change in Labor Demand, %				
	$\delta p_{vai}$	$\delta v_{ai}$	$\delta r_i$	Aggregate	L1*	L2*	L3*	L4*
Crops	-0.1	-1.1	-1.2	-2.3	-0.7	-0.5	-2.3	-3.3
Livestock	-0.6	-1.7	-2.3	-3.3	-1.8	-1.6	-3.3	-4.4
Fishing	0.0	-0.6	-0.6	-1.6	-0.1	0.1	-1.6	-2.7
Other Agriculture	1.4	0.4	1.8	0.7	2.3	2.5	0.7	-0.4
<b>AGRICULTURE</b>	<b>-0.1</b>	<b>-1.1</b>	<b>-1.1</b>	<b>-2.2</b>	<b>-0.7</b>	<b>-0.5</b>	<b>-2.2</b>	<b>-3.4</b>
Mining	-5.0	-5.2	-10.0	-10.9			-10.9	-11.9
Food Manufacturing	-0.7	-1.0	-1.6	-2.7			-2.7	-3.8
Non-food Manufacturing	6.3	4.2	10.7	9.6			9.6	8.4
Construction	-0.7	-1.4	-2.1	-3.1			-3.1	-4.2
Electricity, Gas and Water	2.0	0.3	2.4	1.3			1.3	0.2
<b>INDUSTRY</b>	<b>2.5</b>	<b>1.3</b>	<b>3.7</b>	<b>3.3</b>			<b>3.1</b>	<b>2.5</b>
Wholesale trade & retail	-0.2	-0.6	-0.8	-1.8			-1.8	-2.9
Other Services	0.6	-0.3	0.3	-0.7			-0.7	-1.8
Government services	1.1	0.0		0.0			0.0	0.0
<b>SERVICES</b>	<b>0.4</b>	<b>-0.3</b>	<b>-0.1</b>	<b>-0.7</b>			<b>-0.7</b>	<b>-1.9</b>
<b>TOTAL</b>	<b>0.9</b>	<b>-0.1</b>	<b>0.9</b>				<b>0.2</b>	<b>0.8</b>
Change in average wage, % -->				1.1	-0.5	-0.7	1.1	2.2
Change in unemployment rate, % -->					4.4	8.2	-1.8	-13.1

**Table 30: Actual Tariff, direct tax, base elasticities: Changes in Household Income and Welfare (with wage curve analysis)**

Percentage Change (%)	All	Urban Households						Rural Housholds					
		ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6
Nominal Income	0.60	0.49	0.85	1.12	0.49	0.75	1.59	-1.15	0.37	0.98	0.07	0.71	0.91
Nominal disposable Income	-4.37	-4.35	-4.45	-4.01	-4.36	-4.22	-3.44	-5.83	-4.55	-4.01	-4.69	-4.14	-4.06
Consumer prices /a/	-2.78	-2.76	-2.76	-2.81	-2.79	-2.80	-2.78	-2.70	-2.79	-2.82	-2.77	-2.86	-2.85
Welfare /b/	3.23	3.10	3.36	3.60	3.12	3.54	5.15	1.44	2.96	4.25	2.30	3.38	3.96

/a/ change in sectoral composite price (pqi) x base consumption sharesh in Table 10

/b/ see welfare equation in the text

**Table 31: Actual tariff change, indirect taxes on output, base elasticities**

	Change in Prices			Change in Volumes					$\delta r_i^*$	Change in Labor Demand				
	$\delta p_{m_i}$	$\delta p_{d_i}$	$\delta p_{q_i}$	$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$		L**	L1	L2	L3	L4
Crops	-4.4	-0.3	-0.4	7.7	1.5	-0.9	-0.7	-0.7	-2.3	-1.4	0.0	0.0	-1.4	-2.9
Livestock	1.1	0.0	0.0	-2.8	-0.7	-1.3	-1.3	-1.3	-3.5	-2.4	-1.3	-1.3	-2.6	-4.1
Fishing	-16.6	0.5	0.5	22.0	2.0	-0.7	-0.6	-0.1	-1.2	0.0	1.1	1.1	-0.3	-1.8
Other Agriculture	1.8	1.2	1.2	0.0		0.5	0.5	0.5	0.1	0.9	2.4	2.4	1.1	-0.5
AGRICULTURE	-1.9	0.0	0.0	3.0	1.8	-0.9	-0.8	-0.7	-2.1	-1.3	0.0	0.0	-1.3	-2.9
Mining	-25.1	-8.7	-21.1	9.9	3.0	-11.5	3.8	-5.1	-11.5	-10.3			-10.6	-12.0
Food Manufacturing	-11.4	1.4	0.3	13.9	0.3	-1.5	-0.3	-1.4	-4.6	-3.6			-3.7	-5.2
Non-food Manufacturin	-9.3	-4.4	-6.9	5.7	9.2	0.8	3.2	3.7	7.5	8.6			8.5	6.8
Construction	1.3	-2.2	-2.1	-5.1	3.2	-1.1	-1.2	-1.0	-3.2	-2.3			-2.3	-3.9
Electricity, Gas and Wat	0.0	-0.5	-0.5		3.1	0.4	0.4	0.4	0.6	1.7			1.5	-0.1
INDUSTRY	-10.6	-1.8	-4.7	6.5	7.6	-0.5	1.7	1.2	0.8	2.4			2.2	1.0
Wholesale trade & retail	0.0	2.0	2.0		1.2	-1.5	-1.5	-0.9	-3.6	-2.6			-2.7	-4.2
Other Services	3.0	1.2	1.3	-2.6	1.7	-0.5	-0.6	-0.2	-1.4	-0.4			-0.4	-2.0
Government services	0.0							0.0		0.0			0.0	0.0
SERVICES	3.0	1.4	1.5	-2.6	1.5	-0.8	-0.9	-0.4		-0.8			-0.8	-2.1
TOTAL	-9.0	-1.0	-2.0	5.7	5.1	-0.7	0.5	0.3	-1.2				0.0	0.0
Average Wage:										-1.0	-2.0	-2.0	-1.0	1.0
Change (%) in:		Urban Households						Rural Households						
	All	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6	
Income	-1.0	-0.8	-0.9	-1.0	-1.1	-0.8	-0.5	-1.6	-1.1	-1.2	-1.1	-1.0	-0.9	
Disposable Income	-1.0	-0.9	-0.9	-1.1	-1.2	-0.8	-0.6	-1.8	-1.2	-1.1	-1.2	-1.2	-0.7	
Consumer prices	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.4	-0.3	-0.4	
EV	0.9	0.9	1.1	0.9	0.6	1.2	1.9	-0.1	0.5	1.2	0.3	0.7	1.4	

\* change in the rate of return to capital

\*\* L is aggregate labor, L1, L2, L3, & L4 are labor type 1, 2, 3, 4 respectively

**Table 32: Actual tariff change, direct taxes on firms, base elasticities**

	Change in Price			Change in Volumes					$\delta r_i^*$	Change in Labor Demand				
	$\delta p_{m_i}$	$\delta p_{d_i}$	$\delta p_{q_i}$	$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$		L**	L1	L2	L3	L4
Crops	-5.9	-0.8	-0.9	9.6	-0.2	-1.2	-1.0	-1.1	-1.1	-2.2	0.0	0.0	-2.3	-4.0
Livestock	-0.4	-1.4	-1.3	-3.0	-1.1	-1.6	-1.7	-1.6	-2.2	-3.2	-1.2	-1.2	-3.4	-5.1
Fishing	-18.5	-1.4	-1.5	22.0	1.2	-1.0	-1.0	-0.6	-0.5	-1.4	0.6	0.6	-1.7	-3.4
Other Agriculture	-0.1	0.6	0.6	0.9		0.4	0.4	0.4	1.9	0.9	3.0	3.0	0.7	-1.1
AGRICULTURE	-3.3	-1.0	-1.0	3.9	0.5	-1.2	-1.1	-1.0	-1.0	-2.1	0.0	0.0	-2.2	-4.1
Mining	-25.8	-9.4	-21.8	10.4	2.6	-11.5	4.2	-5.2	-10.0	-10.3			-11.0	-12.6
Food Manufacturing	-14.0	-1.7	-2.8	14.2	1.0	-1.1	0.1	-0.9	-1.4	-2.4			-2.6	-4.3
Non-food Manufacturing	-10.4	-6.2	-8.3	5.3	10.1	0.9	3.1	4.2	10.7	9.6			9.4	7.5
Construction	0.0	-3.5	-3.4	-5.5	2.9	-1.4	-1.5	-1.4	-2.1	-3.0			-3.3	-5.0
Electricity, Gas and Water	0.0	-2.1	-2.1		2.8	0.3	0.3	0.3	2.3	0.9			1.1	-0.7
INDUSTRY	-11.9	-3.9	-6.5	6.2	8.5	-0.4	1.7	1.5	3.4	3.0			2.6	1.3
Wholesale trade & retail	0.0	-1.3	-1.3		0.5	-1.0	-1.0	-0.7	-0.9	-1.9			-2.1	-3.8
Other Services	0.0	-1.4	-1.3	-2.3	1.2	-0.6	-0.7	-0.3	0.3	-0.8			-0.9	-2.7
Government services	0.0							0.0		0.0			-0.1	0.0
SERVICES	0.0	-1.4	-1.3	-2.3	0.9	-0.7	-0.8	-0.4		-0.8			-0.9	-2.8
TOTAL	-10.4	-3.2	-4.0	5.5	5.4	-0.6	0.5	0.4	0.9				0.0	0.0
Average Wage:										1.0	-1.0	-1.0	1.0	3.0
Change (%) in:		Urban Households						Rural Households						
	All	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6	
Income	0.6	0.6	0.9	1.1	0.5	0.7	1.6	-1.0	0.6	1.0	0.1	0.8	0.9	
Disposable Income	0.6	0.5	0.8	1.1	0.5	0.7	1.6	-1.1	0.3	1.1	0.1	0.7	0.9	
Consumer prices	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.7	-2.8	-2.8	-2.8	-2.9	
EV	3.2	3.5	3.2	3.6	3.3	3.2	2.4	1.9	3.2	2.3	3.7	3.6	2.9	

\* change in the rate of return to capital

\*\* L is aggregate labor, L1, L2, L3, & L4 are labor type 1, 2, 3, 4 respectively

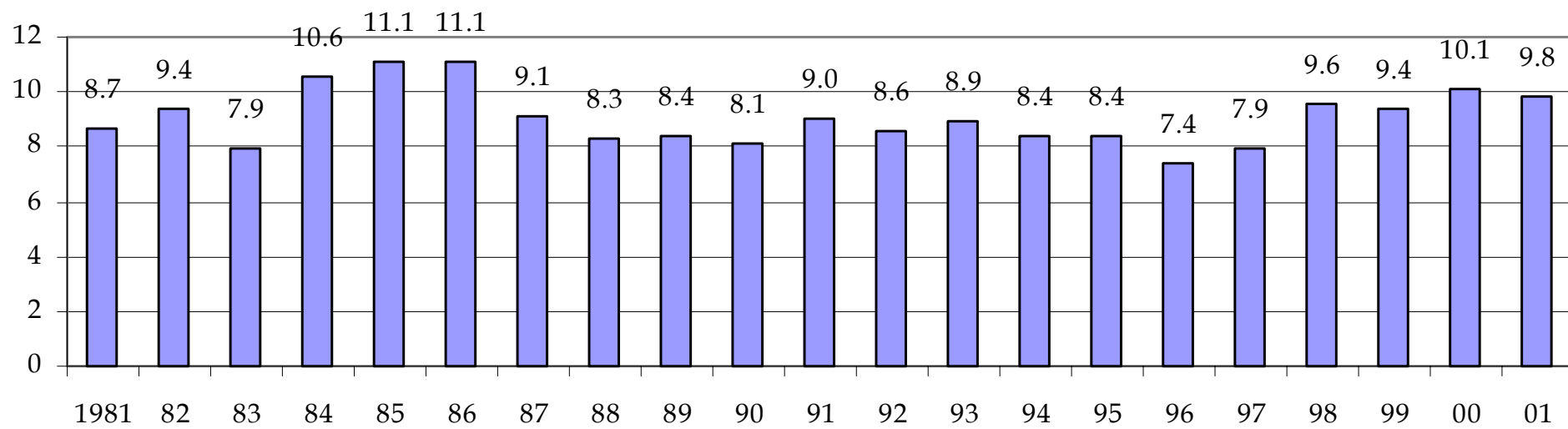
**Table 33: Uniform Tariff, direct income, base elasticities**

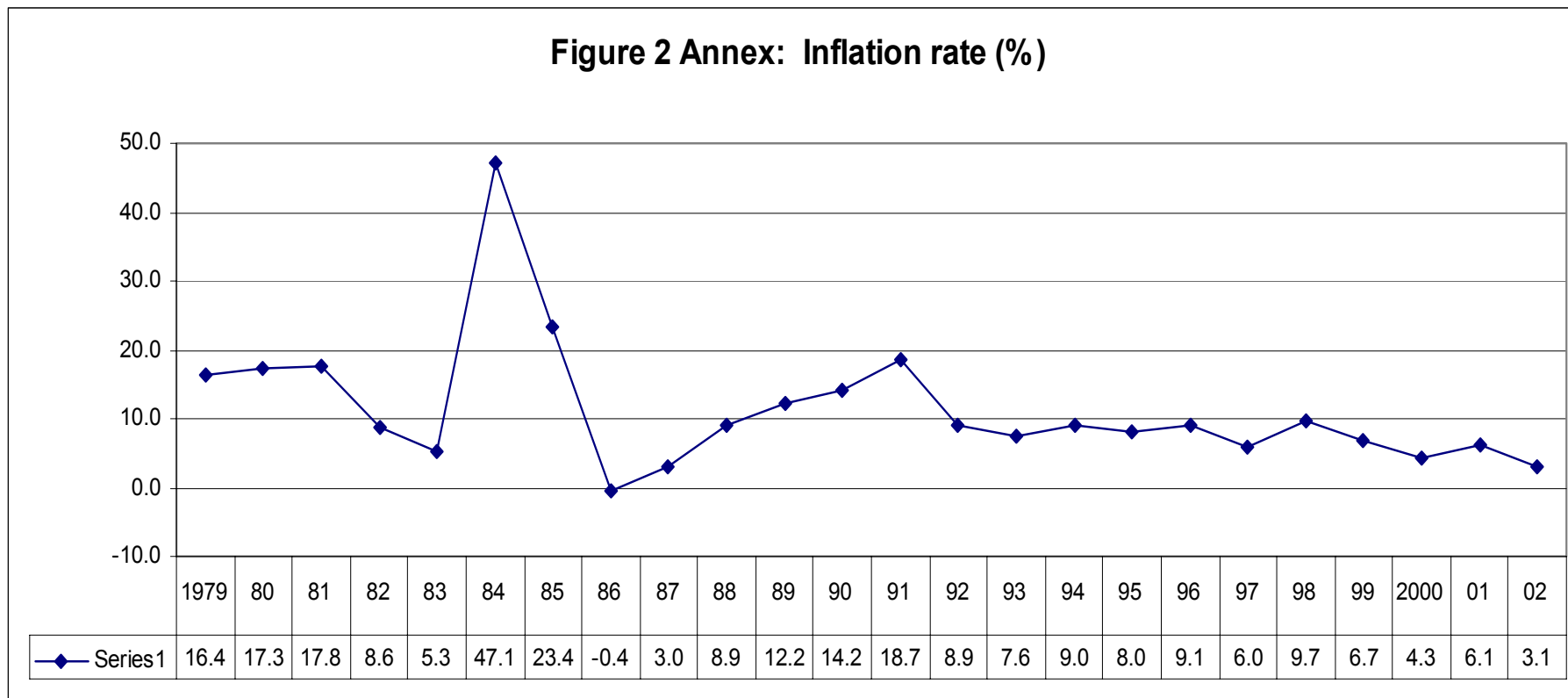
	Change in Prices			Change in Volumes						Change in Labor Demand				
	$\delta p_{m_i}$	$\delta p_{d_i}$	$\delta p_{q_i}$	$\delta m_i$	$\delta e_i$	$\delta d_i$	$\delta q_i$	$\delta x_i$		$\delta r_i^*$	L**	L1	L2	L3
Crops	-8.6	-1.5	-1.6	14.0	0.3	-1.5	-1.2	-1.4	-1.9	-2.8	-0.1	-0.1	-2.9	-4.8
Livestock	0.0	-2.1	-2.0	-4.8	-1.1	-1.9	-2.0	-1.9	-3.0	-3.7	-1.2	-1.2	-4.0	-5.9
Fishing	-20.4	-2.2	-2.2	23.8	2.0	-1.3	-1.3	-0.6	-0.9	-1.4	0.9	0.9	-1.9	-3.9
Other Agriculture	0.0	0.2	0.1	0.5		0.3	0.3	0.3	1.5	0.9	3.4	3.4	0.5	-1.5
AGRICULTURE	-4.5	-1.7	-1.7	5.4	1.2	-1.5	-1.4	-1.3	-1.7	-2.5	0.0	0.0	-2.8	-4.7
Mining	-25.6	-9.5	-21.6	10.7	3.6	-10.8	4.6	-4.4	-8.5	-9.0			-9.5	-11.2
Food Manufacturing	-21.4	-2.6	-4.4	24.1	1.7	-1.5	0.4	-1.2	-2.5	-3.2			-3.5	-5.3
Non-food Manufacturing	-12.1	-7.1	-9.6	6.1	11.6	0.8	3.4	4.7	11.6	10.7			10.5	8.3
Construction	0.0	-4.2	-4.1	-6.6	3.6	-1.6	-1.8	-1.6	-2.8	-3.5			-3.8	-5.6
Electricity, Gas and Water	0.0	-2.7	-2.7		3.6	0.3	0.3	0.4	2.2	1.7			1.2	-0.8
INDUSTRY	-13.8	-4.8	-7.8	7.6	9.8	-0.6	2.0	1.7	3.4	3.3			2.8	1.4
Wholesale trade & retail	0.0	-1.8	-1.8		1.0	-1.1	-1.1	-0.7	-1.2	-1.9			-2.2	-4.1
Other Services	0.0	-2.0	-1.9	-3.0	1.8	-0.6	-0.8	-0.3	0.1	-0.7			-0.9	-2.9
Government services	0.0							0.0		0.0			-0.2	0.0
SERVICES	0.0	-1.9	-1.8	-3.0	1.5	-0.8	-0.9	-0.3		-0.7			-0.9	-2.9
TOTAL	-12.1	-4.1	-5.0	6.7	6.4	-0.8	0.6	0.5	0.7				0.0	0.0
Average Wage:										1.0	-2.0	-2.0	1.0	3.0
Change (%) in:		Urban Households						Rural Households						
	All	ur1	ur2	ur3	ur4	ur5	ur6	rur1	rur2	rur3	rur4	rur5	rur6	
Income	0.35	0.18	0.69	0.88	0.27	0.59	1.41	-1.64	0.29	0.75	-0.33	0.48	0.45	
Disposable Income	-5.5	-5.6	-5.7	-5.2	-5.5	-5.3	-4.6	-7.2	-5.7	-5.3	-5.9	-5.3	-5.2	
Consumer prices	-3.76	-3.77	-3.77	-3.72	-3.74	-3.79	-3.74	-3.68	-3.75	-3.82	-3.74	-3.79	-3.89	
EV	4.35	4.22	4.41	4.61	4.22	4.67	6.38	2.48	4.10	5.53	3.42	4.59	5.29	

\* change in the rate of return to capital

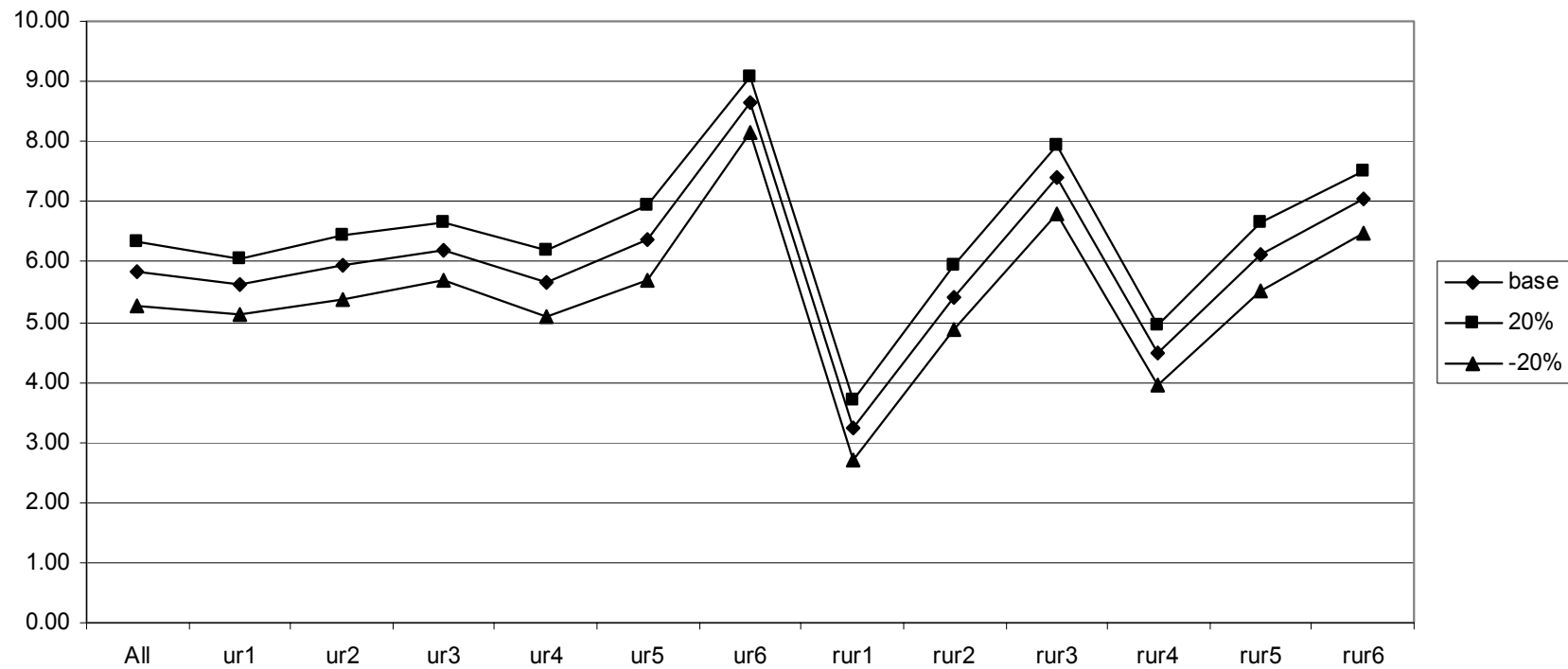
\*\* L is aggregate labor, L1, L2, L3, & L4 are labor type 1, 2, 3, 4 respectively

**Figure 1 Annex: Unemployment Rate (%)**



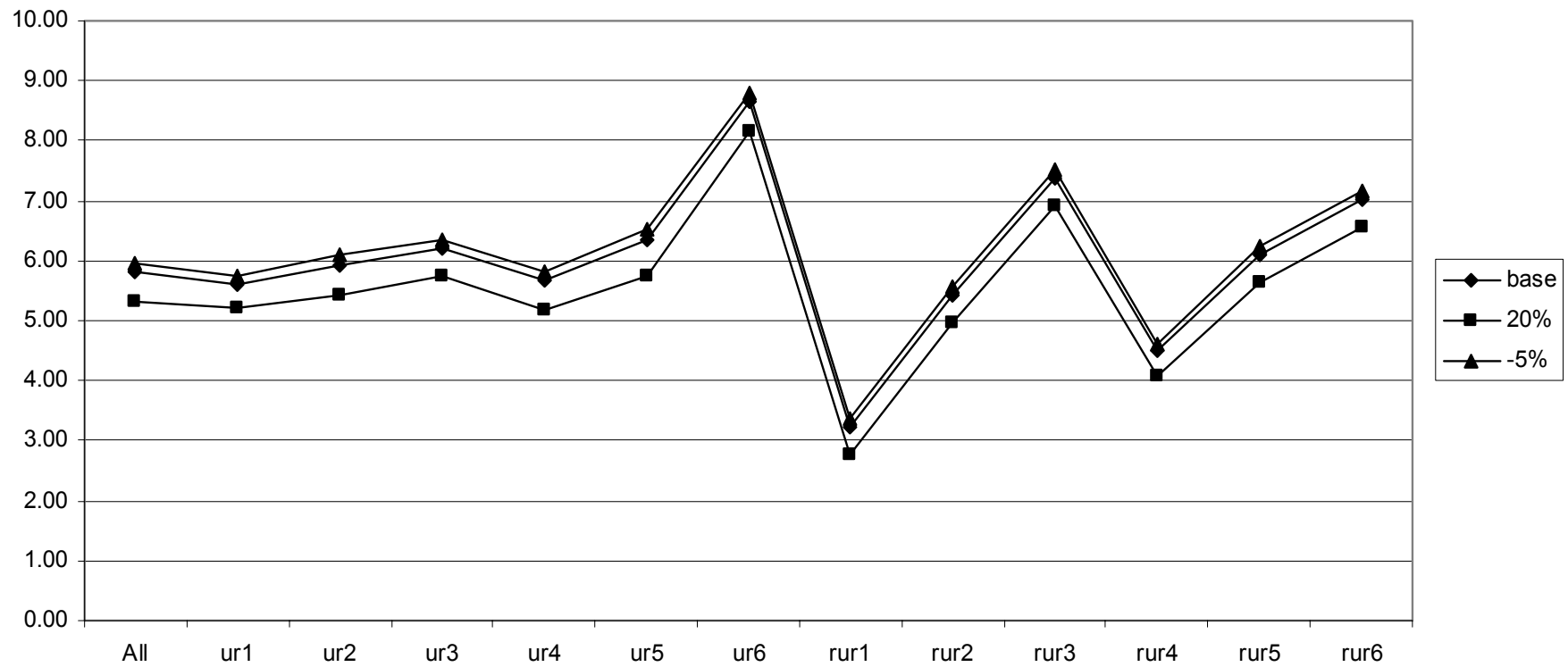


**Figure 3 Annex: Sensitivity Analysis - Armington Elasticities**

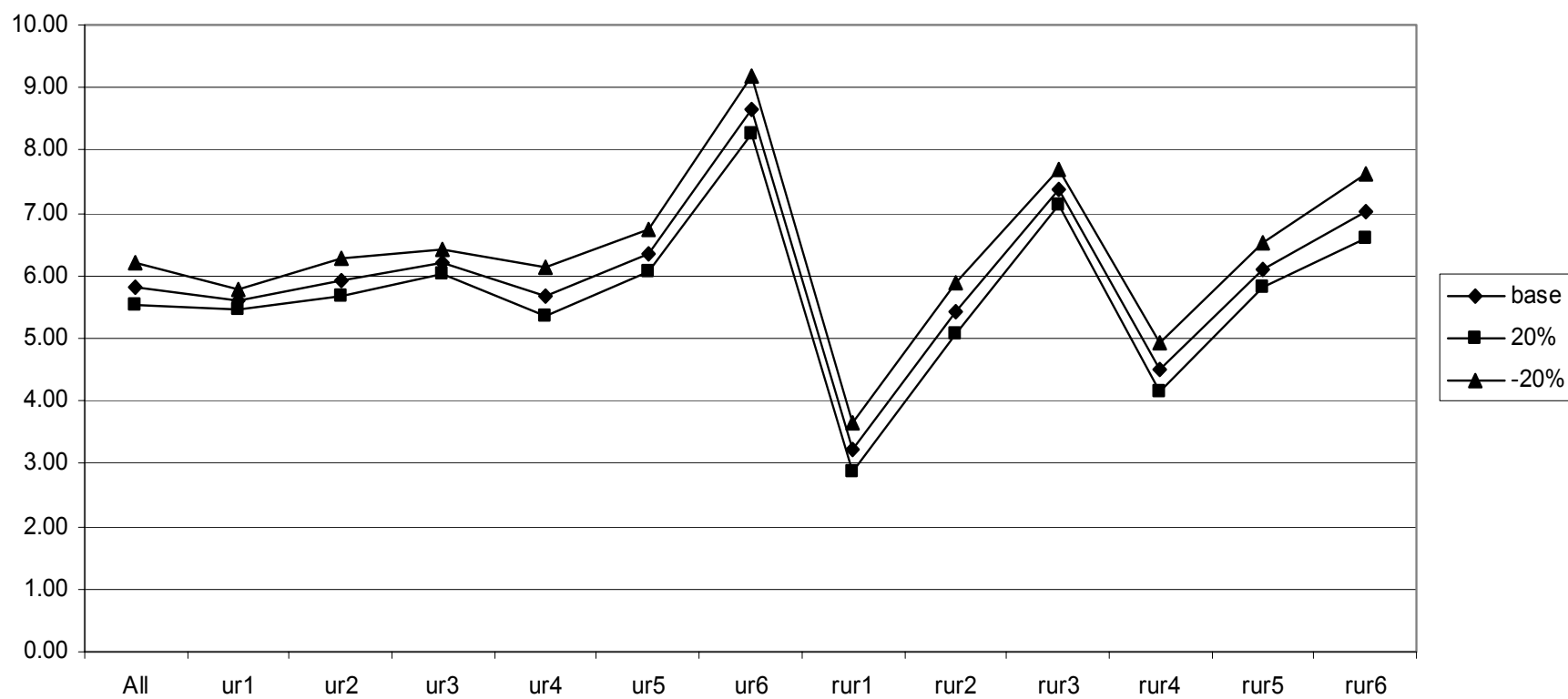




**Figure 4 Annex: Sensitivity Analysis - CET Elasticities**



**Figure 5 Annex: Sensitivity Analysis - Value Added Elasticities**



**Appendix**  
**Philippine Computable General Equilibrium Model (PCGEM)**  
**Core Equations**

- (1)  $x_i = va_i \cdot kt\_in_i$  12
- (2)  $va_{td} = kt\_va_{td} \cdot \left[ sh\_va_{td} \cdot k_{td}^{-rh\_va_{td}} + (1 - sh\_va_{td}) \cdot l_{td}^{-rh\_va_{td}} \right]^{\frac{-1}{rh\_va_{td}}}$  11
- (3)  $va_{ntd} = l_{ntd}$  1
- (4)  $inp_i = kt\_inp_i \cdot x_i$  12
- (5)  $mat_{td,i} = aij_{td,i} \cdot inp_i$  132
- (6)  $l_{td} = va_{td} \cdot \left[ \frac{pva_{td} \cdot (1 - sh\_va_{td})}{w \cdot kt\_va_{td}^{rh\_va_{td}}} \right]^{\frac{1}{1+rh\_va_{td}}}$  11
- (7)  $l_{ntd} = \frac{px_{ntd} \cdot x_{ntd} - \sum_{td} mat_{td,ntd} \cdot pd_{td}}{w}$  1
- (8)  $l1_i = \left( \frac{w}{wl} \right) \cdot sh\_l1_i \cdot l_i$  12
- (9)  $l2_i = \left( \frac{w}{w2} \right) \cdot sh\_l2_i \cdot l_i$  12
- (10)  $l3_i = \left( \frac{w}{w3} \right) \cdot sh\_l3_i \cdot l_i$  12
- (11)  $l4_i = \left( \frac{w}{w4} \right) \cdot sh\_l4_i \cdot l_i$  12
- (12)  $x_{td\_1e} = kt\_x_{td\_1e} \cdot \left[ sh\_x_{td\_1e} \cdot e_{td\_1e}^{rh\_e_{td\_1e}} + (1 - sh\_x_{td\_1e}) \cdot d_{td\_1e}^{rh\_e_{td\_1e}} \right]^{\frac{1}{rh\_e_{td\_1e}}}$  10
- (13)  $x_{td\_0e} = d_{td\_0e}$  1
- (14)  $e_{td\_1e} = d_{td\_1e} \cdot \left[ \left( \frac{pe_{td\_1e}}{pl_{td\_1e}} \right) \cdot \left( \frac{1 - sh\_x_{td\_1e}}{sh\_x_{td\_1e}} \right) \right]^{sig\_e_{td\_1e}}$  10
- (15)  $q_{td\_1m} = kt\_q_{td\_1m} \cdot \left[ sh\_q_{td\_1m} \cdot m_{td\_1m}^{rh\_m_{td\_1m}} + (1 - sh\_q_{td\_1m}) \cdot d_{td\_1m}^{rh\_m_{td\_1m}} \right]^{\frac{1}{rh\_m_{td\_1m}}}$  9
- (16)  $q_{td\_0m} = d_{td\_0m}$  2
- (17)  $m_{td\_1m} = d_{td\_1m} \cdot \left[ \left( \frac{pd_{td\_1m}}{pm_{td\_1m}} \right) \cdot \left( \frac{sh\_q_{td\_1m}}{1 - sh\_q_{td\_1m}} \right) \right]^{sig\_m_{td\_1m}}$  9
- (18)  $ct_h = dyh_h - savh_h$  12
- (19)  $ch_{td,h} = \frac{kt\_ch_{td,h} \cdot ct_h}{pq_{td}}$  132
- (20)  $g = px_{s12''} \cdot x_{s12''}$  1

$$\begin{aligned}
(21) \quad inv_{td} &= \frac{kt\_inv_{td} \cdot tinv\_n}{pq_{td}} & 11 \\
(22) \quad yl1 &= \sum_i w1 \cdot l1_i & 1 \\
(23) \quad yl2 &= \sum_i w2 \cdot l2_i & 1 \\
(24) \quad yl3 &= \sum_i w3 \cdot l3_i & 1 \\
(25) \quad yl4 &= \sum_i w4 \cdot l4_i & 1 \\
(26) \quad yk\_ag &= \sum_{ag} r_{ag} \cdot k_{ag} & 1 \\
(27) \quad yk\_ind &= \sum_{ind} r_{ind} \cdot k_{ind} & 1 \\
(28) \quad yk\_ser\_tra &= r_{s10} \cdot k_{s10} & 1 \\
(29) \quad yk\_ser\_oth &= r_{s11} \cdot k_{s11} & 1 \\
(30) \quad & & 12 \\
& yh_h = w1 \cdot endw\_l1_h + w2 \cdot endw\_l2_h + w3 \cdot endw\_l3_h + w4 \cdot endw\_l4_h \\
& + k\_yk\_ag_h \cdot lmda\_ag \cdot yk\_ag + k\_yk\_ind_h \cdot lmda\_ind \cdot yk\_ind \\
& + k\_yk\_ser\_tra_h \cdot lmda\_ser\_tra \cdot yk\_ser\_tra \\
& + k\_yk\_ser\_oth_h \cdot lmda\_ser\_oth \cdot yk\_ser\_oth \\
& + kt\_div_h \cdot div + trgov_h \cdot pindex + yfor_h \\
(31) \quad dyh_h &= yh_h \cdot (1 - dtxrh_h) & 12 \\
(32) \quad & & 1 \\
& yf = [(1 - lmda\_ag - lmda\_ag\_f) \cdot yk\_ag \\
& + (1 - lmda\_ind - lmda\_ind\_f) \cdot yk\_ind \\
& + (1 - lmda\_ser\_tra - lmda\_ser\_tra) \cdot yk\_ser\_tra \\
& + (1 - lmda\_ser\_oth - lmda\_ser\_oth) \cdot yk\_ser\_oth] \cdot (1 - dtxrf) \\
(33) \quad yg &= tmrev + dtxrev + itxrev + grant\_for & 1 \\
(34) \quad tmrev &= \sum_{td\_1m} tm_{td\_1m} \cdot m_{td\_1m} & 1 \\
(35) \quad & & 1 \\
& dtxrev = \sum_h dtxrh_h \cdot yh_h + [(1 - lmda\_ag - lmda\_ag\_f) \cdot yk\_ag \\
& + (1 - lmda\_ind - lmda\_ind\_f) \cdot yk\_ind \\
& + (1 - lmda\_ser\_tra - lmda\_ser\_tra) \cdot yk\_ser\_tra \\
& + (1 - lmda\_ser\_oth - lmda\_ser\_oth) \cdot yk\_ser\_oth] \cdot dtxrf \\
(36) \quad & & 1 \\
& itxrev = \sum_{td} itxr_{td} \cdot (1 +ntaxr) \cdot d_{td} \cdot pl_{td} + \\
& \sum_{td\_1m} itxr_{td\_1m} \cdot (1 +ntaxr) \cdot m_{td\_1m} \cdot pwm_{td\_1m} \cdot er \cdot (1 + tm_{td\_1m}) \\
(37) \quad in\_td_{td} &= \sum_i mat_{td,i} & 11 \\
(38) \quad tinv\_n &= pinv \cdot tinv\_r & 1 \\
(39) \quad savh_h &= adj \cdot aps_h \cdot dyh_h & 12 \\
(40) \quad savf &= yf - div - div \cdot for & 1
\end{aligned}$$

- (41)  $savg = yg - g - \sum_h trgov_h \cdot pindex - paygv\_for$  1
- (42)  $pindex = \sum_{td} sh\_q1_{td} \cdot pq_{td}$  1
- (43)  $pinv = \prod_{td} \left( \frac{pq_{td}}{kt\_inv_{td}} \right)^{kt\_inv_{td}}$  1
- (44)  $pm_{td\_1m} = pwm_{td\_1m} \cdot er \cdot (1 + tm_{td\_1m}) \cdot (1 + itxr_{td\_1m} \cdot (1 +ntaxr))$  9
- (45)  $pe_{td\_1e} = pwe_{td\_1e} \cdot er$  10
- (46)  $pq_{td\_1m} = \frac{pd_{td\_1m} \cdot d_{td\_1m} + pm_{td\_1m} \cdot m_{td\_1m}}{q_{td\_1m}}$  9
- (47)  $pq_{td\_0m} = pd_{td\_0m}$  2
- (48)  $px_{td\_1e} = \frac{pl_{td\_1e} \cdot d_{td\_1e} + pe_{td\_1e} \cdot e_{td\_1e}}{x_{td\_1e}}$  10
- (49)  $px_{td\_0e} = pl_{td\_0e}$  1
- (50)  $pd_{td} = pl_{td} \cdot [1 + itxr_{td} \cdot (1 +ntaxr)]$  11
- (51)  $pva_i = \frac{px_i \cdot x_i - \sum_{td} mat_{td,i} \cdot pq_{td}}{va_i}$  12
- (52)  $r_{td} = \frac{pva_{td} \cdot va_{td} - w \cdot l_{td}}{k_{td}}$  11
- (53)  $q_{td\_0s11} = \sum_h ch_{td\_0s11,h} + inv_{td\_0s11} + in\_td_{td\_0s11}$  10
- (54)  $tin\_n = \sum_h savh_h + savf + savg + cab$  1
- (55)  $cab = [\sum_{td\_1m} pwm_{td\_1m} \cdot m_{td\_1m} + lmda\_ag\_f \cdot yk\_ag$   
 $+ lmda\_ind\_f \cdot yk\_ind + lmda\_ser\_tra\_f \cdot yk\_ser\_tra$   
 $+ lmda\_ser\_oth \cdot yk\_ser\_oth + div\_for + paygv\_for -$   
 $\sum_{td\_1e} pwe_{td\_1e} \cdot e_{td\_1e} - \sum_h yfor_h - grant\_for] \cdot er$  1
- (56)  $ls = \sum_i l_i$  1
- (57)  $ls1 = \sum_i l1_i$  1
- (58)  $ls2 = \sum_i l2_i$  1
- (59)  $ls3 = \sum_i l3_i$  1
- (60)  $ls4 = \sum_i l4_i$  1
- (61)  $leon = q_{s11} - \sum_h ch_{s11,h} + inv_{s11} + in\_td_{s11}$  1

Total Number of Equations

583

**Philippine Computable General Equilibrium Model (PCGEM)**

Equations				Variables			
Name*	Equation No.	Equation Index	Number of Equations	Variables		Type of Variable	
				Name	Index	Endogenous	Exogenous
						No. of Variables	No. of Variables
xeq	1	i	12	x	td	11	
vaeq1	2	td	11	va	i	12	
vaeq2	3	ntd	1				
intpeq	4	i	12	intp	i	12	
mateq	5	td,i	132	mat	td,i	132	
leq1	6	td	11	l	i	12	
leq2	7	ntd	1				
foc_l1eq	8	i	12	l1	i	12	
foc_l2eq	9	i	12	l2	i	12	
foc_l3eq	10	i	12	l3	i	12	
foc_l4eq	11	i	12	l4	i	12	
ceteq1	12	td_1e	10				
ceteq2	13	td_0e	1				
eeq	14	td_1e	10	e	td_1e	10	
qeq1	15	td_1m	9	q	td	11	
qeq2	16	td_0m	2				
meq	17	td_1m	9	m	td_1m	9	
cteq	18	h	12	ct	h	12	
cheq	19	td,h	132	ch	td,h	132	
geq	20		1	g			1
inveq	21	td	11	inv	td	11	
yl1eq	22		1	yl1		1	
yl2eq	23		1	yl2		1	
yl3eq	24		1	yl3		1	
yl4eq	25		1	yl4		1	
ykeq_ag	26		1	yk_ag		1	
ykeq_ind	27		1	yk_ind		1	
ykeq_ser_t	28		1	yk_ser_tra		1	
ykeq_ser_o	29		1	yk_ser_oth		1	
yheq	30	h	12	yh	h	12	
dyheq	31	h	12	dyh	h	12	
yfeq	32		1	yf		1	
ygeq	33		1	yg			1
tmreveq	34		1	tmrev		1	
dtxreveq	35		1	itxrev		1	
itxreveq	36		1	dtxrev		1	
intdeq	37	td	11	intd	td	11	
tinveq	38		1	tinveq_n		1	
savheq	39	h	12	savh	h	12	
savfeq	40		1	savf		1	
savgeq	41		1	savg		1	
pindexeq	42		1	pindex		1	
pinveq	43		1	pinveq		1	
pmeq	44	td_1m	9	pm	td_1m	9	
pee	45	td_1e	10	pe	td_1e	10	

## PCGEM (Cont'd)

Equations				Variables			
				Variables		Type of Variable	
Name*	Equation No.	Equation Index	Number of Equations	Name	Index	Endogenous No. of Variables	Exogenous No. of Variables
ppeq1	46	td_1m	9	pq	td	11	
ppeq2	47	td_0m	2				
pxeq1	48	td_1e	10	px	i	12	
pxeq2	49	td_0e	1				
pdeq	50	td	11	pd	td	11	
pvaeq	51	i	12	pva	i	12	
req	52	td	11	r	td	11	
eq1eq	53	td_0s11	10	q	"td_0s11" **	1	
eq2eq	54		1				
eq3eq	55		1	cab			1
eq4eq	56		1	w		1	
eq5_1eq	57		1	w1		1	
eq5_2eq	58		1	w2		1	
eq5_3eq	59		1	w3		1	
eq5_4eq	60		1	w4		1	
walras	61		1	leon		1	
				pl	td	11	
				d	td	11	
				ntaxr		1	
				adj		1	
				x	"s12"***		1
				er			1
				pwe	td_1e		11
				pwm	td_1m		9
				k	td		11
				ls			1
				ls1			1
				ls2			1
				ls3			1
				ls4			1
				endow_11	h		12
				endow_12	h		12
				endow_13	h		12
				endow_14	h		12
				div-for			1
				grant-for			1
				paygv-for			1
				yfor	h		12
				div			1
				trgov	h		12
				dtxrf			1
				dtxrh	h		12
				itxr	td		11
				tm	td_1m		9
TOTAL			583			583	149

\*Equation names in the GAMS code

\*\*\*output of government sector is fixed

\*\*"td\_0s11": the 11th sector

## Variable Definition

$er$	: exchange rate
$pd_{td}$	: domestic price of $td$ including tax
$pet_{d\_1e}$	: domestic price of exports of $td\_1e$
$pl_{td}$	: local price of $td$ excluding tax
$pm_{td\_1m}$	: domestic price of imports of $td\_1m$
$pq_{td}$	: composite price of $td$
$pva_i$	: price of value added of $i$
$pwe_{td\_1e}$	: world price of exports of $td\_1e$
$pwm_{td\_1m}$	: world price of imports of $td\_1m$
$px_i$	: price of output of $i$
$pindex$	: general price
$pinv$	: price of investment
$r_{td}$	: price of capital in $td$
$mat_{td,i}$	: interindustry matrix
$w$	: average wage rate
$w1$	: wage rate of type 1 labor
$w2$	: wage rate of type 2 labor
$w3$	: wage rate of type 3 labor
$w4$	: wage rate of type 4 labor
$x_i$	: output of $i$
$va_i$	: value added of $i$
$intp_i$	: intermediate input
$k_{td}$	: capital in $td$
$l(i)$	: aggregate labor demand in $i$
$l1(i)$	: type 1 labor
$l2(i)$	: type 2 labor
$l3(i)$	: type 3 labor
$l4(i)$	: type 4 labor
$ls$	: total supply of labor
$ls1$	: total supply of type 1 labor
$ls2$	: total supply of type 2 labor
$ls3$	: total supply of type 3 labor
$ls4$	: total supply of type 4 labor
$endw\_l1_h$	: household labor endowment of type 1 labor
$endw\_l2_h$	: household labor endowment of type 2 labor
$endw\_l3_h$	: household labor endowment of type 3 labor
$endw\_l4_h$	: household labor endowment of type 4 labor
$ct_h$	: total consumption of household $h$
$ch_{td,h}$	: household $h$ consumption of $td$
$d_{td}$	: domestic demand for $td$
$g$	: total government consumption
$intd_{td}$	: intermediate demand for $td$
$inv_{td}$	: investment demand for $td$
$tin$	: total investment
$q_{td}$	: composite demand for $td$
$e_{td\_1e}$	: exports of $td\_1e$
$m_{td\_1m}$	: imports of $td\_1m$



cab	: current account balance
div_for	: dividends paid to foreigners
grant_for	: foreign grant to government
paygv_for	: debt service payment of government
yfor <sub>h</sub>	: foreign income of household h
yl1	: type 1 labor income
yl2	: type 2 labor income
yl3	: type 3 labor income
yl4	: type 4 labor income
yk_ag	: capital income in agriculture
yk_ind	: capital income in industry
yk_ser_tra	: capital income in service trade
yk_ser_oth	: capital income in service others
yh <sub>h</sub>	: income of household h
yf	: income of firms
yg	: income of government
div	: dividends
trgov <sub>h</sub>	: government transfer in real terms to household h
dyh <sub>h</sub>	: disposable income of household h
tmrev	: tariff revenue of government
dtxrev	: direct income tax revenue of government
itxrev	: indirect income tax revenue of government
dtxrf	: direct income tax rate on firms
dtxrh <sub>h</sub>	: direct income tax rate on household h
itxr <sub>td</sub>	: indirect tax rate on td
tm <sub>td_1m</sub>	: tariff rate on td_1m
ntaxr	: additional compensatory tax rate
adj	: adjustment factor
savf	: savings of firms
savg	: savings of government
savh <sub>h</sub>	: savings of household
leon	: “walras law” variable

## Index of Variables

### sectors

s1	: crops
s2	: livestock
s3	fishing
s4	other agriculture
s5	mining
s6	food manufacturing
s7	non-food manufacturing
s8	construction
s9	utilities
s10	wholesale and retail trade
s11	other services
s12	government services /

### Special index

td	tradable	{s1,s2,s3,s4,s5,s6,s7,s8,s9,s10,s11}
ntd	nontradable	{s12}
td_1e	with exports	{ s1,s2,s3,s5,s6,s7,s8,s9,s10,s11 }
td_0e	no exports	{s4 }
td_1m	with imports 1	{s1,s2,s3,s4,s5,s6,s7,s8,s11}
td_0m	no imports	{ s9,s10 }
td_0s11	with imports expect “s11”	{s1,s2,s3,s4,s5,s6,s7,s8,s9,s10}
ag	agriculture	{s1,s2,s3,s4 }
ind	industry	{ s5,s6,s7,s8,s9 }

### Factors

f	factors	{1, l1, l2, l3, l4,k}
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### Households

h	households	{ur1, ur2 ur3 ur4 ur5 ur6, rur1, rur2 rur3 rur4 rur5 rur6}
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### Other Institutions

inst	{firms, government}
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