Philippine Tariff Reduction Program: Poverty Effect Insights from A CGE Analysis[i]

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Abstract

A CGE micro-simulation model is employed to assess the economic and poverty impacts of tariff reduction in the Philippines. Tariff reduction induces consumers to substitute cheaper imported agricultural products for domestic goods, thereby resulting in a contraction in agricultural output. In contrast, tariff reduction reduces the domestic cost of production, benefiting the outward-oriented and import-dependent industrial sector. The national poverty headcount decreases marginally as lower consumer prices outweigh the income reduction experienced by the majority of households. However, both the poverty gap and severity of poverty worsens, implying that the poorest of the poor become even poorer.

Keywords: International trade, poverty, computable general equilibrium, micro-simulation, Philippines

JEL classification: D58, E27, F13, I32, O13, O24, O53

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1. Introduction

The Philippines has undertaken substantial trade policy reforms since the 1980s to enhance domestic-producer efficiency and encourage exports. As a result, the country's trade-policy environment has significantly changed. The inherent bias towards manufacturing and against agriculture, which prevailed starting the 1960s, waned by the 1990s. Instead, the current system of protection favors agriculture as quantitative restrictions (QRs) were replaced by high nominal tariff rates especially when the country became a part of the World Trade Organization (WTO).

Two decades have passed since the onset of trade reforms in the Philippines and evidence suggest that the rapid pace of tariff reduction imposed upon manufacturing has delivered some of the promised benefits (Austria, 2002). Although the sector achieved modest expansion, a correlation analysis by Aldaba (2005) revealed that least-protected sub-sectors performed well. On the other hand, the relative protection afforded agriculture failed to induce competitiveness and productivity growth as the sector became inward-looking and inefficient. Because of this, calls to undertake further liberalization through tariff reduction have emerged.

This has received considerable attention and has been the subject of very intense debate, most crucial of which is the likely economic and poverty impacts of further tariff reduction. Will further tariff reduction be favorable or harmful to the poor? How will this affect rural households who are among the very poor? What will be the impact among farm workers whose income mainly depends on agriculture? What alternative or complementary policies may be implemented in order to ensure a more equitable distribution of the gains from freer trade? What are the channels through which these changes are most likely to affect the poor?

This paper assesses the economy-wide effects of tariff reduction in the Philippine economy by using a computable general equilibrium (CGE) model calibrated to

Philippine data and integrated with 24,797 households[1]. Two counterfactual policy experiments were carried out to analyze the economic and poverty effects of tariff reduction. The first involves simulating the actual tariff reduction undertaken between 1994 and 2000 to understand the economic and poverty effects of tariff reduction in the Philippine economy. The second simulates a full tariff elimination scenario in order to assess and identify the possible impacts of further tariff reductions in the country.

The remaining sections are organized as follows: Section 2 provides a brief survey of trade and poverty literature. Section 3 discusses the trade policies in the Philippines, while section 4 introduces the model, its assumptions, and parameters. Section 5 explains the economic structure based on the 1994 Social Accounting Matrix (SAM). Section 6 lays out the counter-factual policy experiments and discusses the simulation results. Finally, the concluding remarks are presented in section 7.

2. Survey of literature

Analyzing the link between trade and poverty has become an important research agenda in recent years (Winters, 2001; Winters, Mcculloch, and Mckay, 2004; Hertel and Reimer, 2004). In particular, the need to identify the transmission channels to assess how international trade may affect household poverty characteristics has been emphasized. This is because trade liberalization may affect poverty through a variety of linkages such as[2]: (1) the price and availability of goods; (2) factor prices, income, and employment; (3) government taxes and transfers influenced by changes in revenue from trade taxes; (4) the incentives for investment and innovation, which affect long-run economic growth; (5) external shocks, in particular changes in terms of trade, and; (6) short-run risk and adjustment costs.

Two methodologies—bottom-up and top-down—have been employed to analyze the poverty impacts of trade liberalization. The former focuses on detailed household

survey data while the latter utilizes an economy-wide CGE model with representative household assumptions based on a coherent social-accounting-matrix (SAM) framework. In spite of the methodological difference, both approaches stress the importance of factor income on poverty. This is because households, especially rural households, have specialized earning patterns that are more sensitive to changes in unskilled wages and returns to self-employment (Hertel and Reimer, 2004). A study by Coxhead and Warr (1995) on agricultural productivity in the Philippines confirms that income effects dominate consumption effects as the former accounts for two-thirds of poverty-alleviation impacts.

Recently, the use of CGE models to facilitate the analysis of poverty and income distributions arising from macroeconomic shocks has become widespread. A popular but restrictive approach is to assume a log-normal distribution of income within each category where the variance is estimated from the base-year data (De Janvry, Sadoulet, and Fargeix, 1991). Decaluwé et al. (2000) argue that a beta distribution is preferable to other distributions because it can be skewed to the left or right and thus may better represent the types of intra-category income distributions commonly observed. Regardless of the distribution chosen, it must be assumed that all but the first moment is fixed and unaffected by the shock being analyzed. This assumption is hard to defend given the heterogeneity of income sources and consumption patterns of households even within disaggregated categories. Indeed it is often found that intra-category income variance amounts to more than half of total income variance (Cockburn, 2001).

An alternative approach is to model each household individually as in Cockburn (2001) where a CGE model for Nepal was constructed with as many households based on the household survey data. This was the same approach Cororaton and Cockburn (2003) utilized to analyze the poverty effects of trade liberalization in the Philippines. This paper follows Cororaton and Cockburn (2003) by employing a detailed 35-sector

CGE model integrated with 24,797 households. The rationale behind this approach stems from modeling each household individually and that counterfactual analysis using CGE models facilitates an analytical identification of the impacts of trade on poverty.

3. Background

3.1 Trade-policy environment (1945–1980)[3]

The balance-of-payments (BOP) crisis that transpired barely four years after the war ended in 1945 shaped the Philippine industrial and agricultural policy landscape. The high import demand for economic reconstruction coupled with distressed local production led to a decline in international reserves and the 1949 BOP crisis. The crisis spurred a policy response centered on import and foreign-exchange controls. Though initially intended to be short-lived, these policy responses soon became a prominent fixture that resulted in a development strategy geared towards industrial import substitution with lesser emphasis on the agricultural and export sectors.

In 1957, the enactment of the highly protective Tariff Code reinforced the government's import-substitution policy by providing incentives to domestic producers of final consumer goods. High tariff rates were imposed on non-essential consumer goods while low rates were applied to essential producer inputs. The presence of a highly skewed inter-sectoral tariff protection in favor of import-substituting manufactured goods created a strong bias against agriculture and exports. The weighted average EPRs of the manufacturing sector was 44 percent in 1974, compared to a much lower 9-percent protection rate for agriculture and mining. Moreover, Tan (1979) revealed a highly skewed protection structure with exportable goods, which mainly consist of agricultural products having a 4-percent protection rate as opposed to 61 percent for non-exportables. Moreover, consumption goods had a 77-percent protection rate compared to 23 percent and 18 percent for intermediate and capital goods, respectively.

The impact of all these on agriculture was devastating. The policy bias towards import substitution and against agriculture and exports led to market distortions that promoted rent-seeking activities and distorted economic incentives against investments in agriculture. Hence, the sector, which served as the country's backbone that provided the necessary foreign exchange needed by the import-dependent manufacturing sector, stagnated and eroded its comparative advantage. On the other hand, the highly protected manufacturing sector, which hid behind the infant-industry argument, did not live up to its promise. The almost-30 years of protection simply resulted in the sector venturing on import-dependent-assembly-type operations with minimal value-added content and little or no forward and backward linkages.

Realizing the pitfalls of an import-substitution policy, the government initiated an outward-looking strategy geared towards export promotion. Spurred by the structural policy adjustments prescribed by multilateral agencies (World Bank and International Monetary Fund) in the late 1970s, the government started its Trade Reform Program (TRP) in 1981.

3.2 Philippine trade reform

The first phase of the TRP (TRP-1) started in the early 1980s with three major components: tariff reduction, import-liberalization program, and complementary realignment of the indirect taxes. The maximum tariff rates were reduced from 100 to 50 percent. Between 1983 and 1985, sales taxes on imports and locally produced goods were equalized. The markup applied on the value of imports (for sales-tax valuation) was also reduced and eventually eliminated. The implementation of TRP-1 was suspended in the mid-1980s because of a BOP crisis but it resumed in 1986.

In 1991, the government launched TRP-2 to realign tariff rates over a five-year period. The realignment involved the narrowing of tariff rates through a series of

reductions of the number of commodity lines with high tariffs and an increase in the commodity lines with low tariffs. The program was aimed at the clustering of tariff rates within the 10–30-percent range by 1995. In 1992, a program of converting QRs into tariff equivalents was initiated. In 1994, the country became part of the WTO, committing to gradually remove QRs on sensitive agricultural product imports by switching towards tariff measures (with the exception of rice).

In 1995, TRP-3 started with the aim of adopting a uniform 5-percent tariff rate by 2005. The overall program was designed to establish a four-tier tariff schedule: 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. In 1996, the government implemented a tariff-quota system among sensitive agricultural products. The minimum-access-volume (MAV) provision was instituted in which a relatively low tariff rate is imposed up to a minimum level (in-quota tariff rate) while a higher tariff rate is levied beyond it (out-quota tariff rate).

In 1998, TRP-4 was undertaken to recalibrate the tariff-rate schedules implemented under previous rounds of TRPs. This resulted from a tariff-review process that evaluated the pace of tariff reduction in line with the competitiveness of the local industry. With this, the planned uniform tariff rate was suspended. Overall, the various rounds of TRPs were beset by policy reversals due to economic and political reasons, particularly lobbying by interest groups (Aldaba, 2005).

3.3 Trade-policy environment (1981–2004)

The 1990s witnessed a reversal of protection towards agriculture coupled with accelerating manufacturing-sector liberalization. Nonetheless, trends reveal that: (a) the bias against exports and towards imports has not been addressed; (b) though tariff rates

are low, the tariff structure is still distorted; (c) the reversal of protection towards agriculture, particularly on sensitive products, constrained growth and efficiency in the sector

The frequency distribution of tariff rates for the period 1980–2004 is now within the 0–50-percent range (Austria, 2002). The applied nominal tariff rates for manufacturing are already lower than the bound tariff rates[4] that the country committed to the WTO. However, this is not the case for agriculture where binding rates remain at 100 percent (Austria, 2002). In particular, applied tariff rates on sensitive agricultural products still remain within bound-tariff levels.

An analysis of tariff peak and coefficient of variation by Aldaba (2005) reveals that the current tariff structure is heavily distorted[5]. The tariff legislations enacted between 1998 and 2005 (including policy reversals) increased not only the tariff lines but more importantly the percentage of tariff peaks and coefficient of variation. From 1988 to 2005, overall tariff peaks increased from 2.24 to 2.71 percent while overall coefficient of variation increased from 0.44 to 1.07 percent. Similarly, this period reinforced the pro-agriculture bias as the sector's EPR stood at 15.09 percent compared to 5.13 for manufacturing, and the overall EPR of 6.33 percent (Aldaba, 2005). The current tariff structure remains biased towards importables. Thus, exportable goods remain penalized. For instance, food processing, which registered the highest EPR of 15.36 percent, shows a bias towards importables, with 15.01 percent compared to 0.35 percent for exportables (Aldaba, 2005).

However, the heavy protection afforded agriculture hampered its efficiency as Philippine farm-gate prices have become higher than most Asian countries (Habito and Briones, 2005). In part, this can be explained by a 10.16-percent EPR afforded to importable agricultural goods against 4.93 percent to exportables (Aldaba 2005).

4. The model

Basic structure. The CGE model was calibrated to the 1994 SAM of the Philippine economy. It has 35 production sectors composed of 13 agriculture, fishing and forestry, 19 industry, and 3 services, which include government services. Factors of production are classified as capital, land, and labor. In turn, labor is further classified by skill (skilled and unskilled) and by industry (agriculture and production). The model integrates the entire 1994 Family Income and Expenditure Survey (FIES) with 24,797 households. Consumer demand is derived from Cobb-Douglas utility functions.

The model's production structure operates under constant returns to scale. Gross output is produced through a linear aggregation of intermediate inputs and value added. Intermediate input is determined using a fixed Leontief coefficient, whereas value added is a Cobb-Douglas function of labor and capital. Sectoral capital is fixed. Land and agriculture labor is agriculture specific, whereas production labor is perfectly mobile across all sectors.

Figure 1 illustrates the basic price relationships in the model. Output price, *px*, affects export price, *pe*, and local prices, *pl*. Indirect taxes are added to the local price to determine domestic prices, *pd*, which together with import price, *pm*, determines the composite price, *pq*. The composite price is the price paid by the consumers. Import price, *pm*, is in domestic currency, which is affected by the world price of imports, exchange rate, *er*, tariff rate, *tm*, and indirect tax rate, *itx*. All prices adjust to clear the factor and product markets. An Armington-CES (constant elasticity substitution) function allocates the demand between local and imported goods while a constant-elasticity-of-transformation (CET) function determines the allocation of domestic production between export supply and local sales. The demand side assumes cost minimization while the supply side assumes profit maximization. Hence, both their first-order conditions

generate the necessary import and domestic demand functions as well as the necessary supply and input demand functions.

Poverty. Poverty is measured through Foster-Greer-Thorbecke (FGT) P_α class of additively decomposable measures (Foster, Greer, and Thorbecke, 1984).[6] Poverty indices are calculated before and after the policy shock using the actual distribution of income in the FIES.

Transmission Channels. The changes in the FGT indices (after a policy shock) are influenced by the: (i) changes in household income and (ii) changes in consumer prices, which affect the nominal value of the poverty line. Thus, households' sensitivity to poverty depends on whether the income or the price effect dominates.

Model closure. Nominal government consumption is equal to exogenous real government consumption multiplied by its (endogenous) price. Fixing real government spending neutralizes any possible welfare/poverty effects of variations in government spending. Total government income is held fixed. Any reduction in government income from a tariff reduction is compensated endogenously by the introduction of an additional uniform sales tax. Thus, the government's budget balance (public savings) is endogenously determined. The only variations are due to changes in the nominal price of government consumption.

Total nominal investment is equal to exogenous total real investment multiplied by its price. Total real investment is held fixed in order to abstract from inter-temporal welfare/poverty effects. The price of total real investment is endogenous. The current-account balance (foreign savings) is held fixed and the nominal exchange rate is the model's numéraire. The foreign-trade sector is effectively cleared by changes in the real exchange rate, which is the ratio of the nominal exchange rate multiplied by the world export prices and divided by the domestic price index. The propensities to save of the various household groups in the model adjust proportionately to accommodate the fixed

total real investment assumption. This is undertaken through a factor in the household saving function that adjusts endogenously.

5 Structure at the base

Economic structure. Table 1 presents the economic structure based on the 1994 SAM. The sectoral CES and CET elasticities in the model are derived as one-half of the Armington elasticities for the Philippines in GTAP (Hertel et al., 2004). The pattern of trade points out the dominance of the industrial sector. Indeed, it accounts for roughly 60 percent outperforming the services and agricultural sectors with 34-and 6-percent shares, respectively. Nonetheless, total agricultural exports contributed about 15 percent when agricultural-related food processing is accounted. The principal industrial exports are semiconductor, and textile and garments followed by all processed food exports with a combined 9-percent share. Furthermore, semiconductor, coconut processing, banana, textile and garments, and mining allocates are the most export intensive sectors.

Similarly, 99 percent of total imports accrue to the industrial sector with the remainder going to the agricultural sector. This enormous share stems from the low valued added, import-intensive and assembly-type operation nature of the manufacturing sector—particularly in the semiconductor, and textile and garment subsectors. The motor–vehicles sector[7] has the highest import share followed by semiconductors. The highly import-intensive sectors are mining (72.03 percent, mainly due to crude-oil imports), semiconductors[8], machinery, and fertilizer.

The agricultural sector generally has highest value added ratio compared to industry, although its contribution to the overall value added is relatively small. Agriculture contributes about 20 percent of domestic value added (GDP) whereas industry and services contributes 31.5 and 48.5 percent, respectively. Labor intensity is uniformly higher in agriculture with the exception of fishing and other livestock.

Household income and poverty profile. Figure 2 presents the evolution of the poverty-headcount index and the Gini coefficient from 1985 to 2000. The poverty-headcount index dropped continuously from 49 percent in 1985 to 33 percent in 1997 but then worsened to 34 percent in 2000 as a result of the 1998 El Niño phenomenon and the Asian financial crisis. On the other hand, income inequality steadily increased over this period as the Gini coefficient worsened from 0.42 in 1985 to 0.51 in 2000.

Income generated from labor is the major source for the entire population with 45.5 percent followed by 35.7 percent from capital. Income earned by laborers in the industrial sector and returns to capital in the services sector have the highest share within the labor and capital income block (Table 2).

In 1994, about 41 percent of the population of 67 million was below the poverty threshold (Table 3). National Capital Region (NCR), where majority of the industries are located, has the lowest poverty level while rural areas have the highest. Essentially, three important facts can be inferred from Table 3. First, poverty is influenced by spatial factors. Rural households, which represent roughly half of the population, are substantially poorer than urban households. In the same vein, households residing in NCR or Metro Manila are less prone to poverty compared to other urban dwellers. Second, the degree of poverty depends on human capital. Household heads with at least a high school diploma (skilled workers), regardless of gender, are less susceptible to poverty, since they have better opportunities and options for employment. Third, household head affects poverty. Male-headed households are relatively worse off and much more vulnerable to poverty than their female counterparts.

6. Policy Experiments

TWO POLICY EXPERIMENTS WERE UNDERTAKEN:

i. Actual tariff reduction that occurred between 1994 and 2000[9] (67 percent decrease in overall weighted nominal average tariff rates).

ii. Full tariff elimination

Both experiments entailed the use of a compensatory indirect tax applied uniformly to all consumer goods[10] (i.e. the loss in government revenue due to the tariff reduction was compensated endogenously by an increase in the indirect tax). The rationale behind this is due to government's efforts to increase revenue collection through increases in indirect taxes during the last few years. This was applied through:

$$\begin{aligned} Pd_i &= Pl_i \times [1 + itxr_i \times (1 + ntaxr)] \\ Pm_i &= Pwm_i \times er \times (1 + tm_i) \times [1 + itxr_i \times (1 + ntaxr)] \end{aligned} \qquad (2)$$

where Pd_i is the domestic price with tax, Pl_i is the local price without tax, $itxr_i$ is the indirect tax rate, *ntaxr* is the endogenously determined increase in indirect tax rate, Pm_i is the price of imports, Pwm_i is the world price of imports, *er* is the exchange rate, and tm_i is the tariff rate.

6.1 Simulation results

6.1.1 Actual Tariff Reduction

Macro effects. The actual tariff reduction leads to an 8-percent decline in the local price of imported products (Table 4). As a result, consumer prices decrease by 2 percent, prompting a 0.5-percent increase in consumption. The tariff reduction effectively reduces the price of imported intermediate inputs, resulting in a 3.7-percent fall in the domestic cost of production. This brings about a real-exchange rate depreciation (by 4.6 percent), making Philippine-made products relatively cheaper in the international market.

With this, producers reallocate towards the international market as allocation for domestic sales decreases by 2 percent while total export increases by 10 percent. However, overall imports increase by almost 12 percent due to a larger reduction in import prices. Effectively, import crowds out locally produced goods as consumers substitute cheaper imports for domestic goods. In spite of this, output increases minimally by 0.09 percent.

Sectoral Effects. The actual tariff reduction brings about varying impacts among the three major sectors. Nonetheless, tariff reduction results in a reallocation from the inward-oriented agricultural sector towards the service sector, and the outward oriented industrial sector (Table 5). In general, the price reduction in industry is deeper relative to agriculture as imported intermediate goods became cheaper. An exception is the substantial decline in the price of imported agricultural products and the price of agricultural output because of the heavy protection afforded agriculture in 1994. Hence, import prices fall more while import volumes increase significantly for agricultural goods than for industrial goods, as the initial import-weighted average tariffs rates are higher for the former. On the other hand, industrial exports expand more than that of agriculture and services as lower production cost, together with real exchange rate depreciation makes locally made industrial products relatively cheaper in the international market.

Agriculture. The substantial decline in local import prices induces consumers to substitute cheaper imported agricultural products for their local counterparts. In particular, irrigated rice and fruit imports increases by 92 and 39 percent[11], respectively. Agricultural imports rise by 21 percent, resulting in a 0.2-percent dip in agricultural output. Nonetheless, banana benefits from the tariff reduction as the sector's output and export expands by 7 and 12 percent, respectively. Similarly, the group "other agricultural

crops" registers the highest increase in exports. On the whole, the 21-percent increase in agriculture imports surpasses the 7-percent increase in exports.

Industry. The tariff reduction generally favors the import-dependent and outward-oriented industrial sector as the cost of intermediate inputs falls, thereby resulting in an 11.5-percent surge in import demand. Notably, all food-related processing sectors generate a hefty increase in import demand arising from cheaper imported intermediate inputs.[12] This is not surprising as the removal of high tariff walls frees these sectors from the agricultural protection burden. Industrial producers reallocate towards the international market as cheaper intermediate inputs drives domestic cost of production down. With this, total industrial export increases by 14.6 percent. Semiconductor, textile and garments, motor vehicles, fertilizer, and coconut processing emerge as the biggest gainers, realizing a substantial increase in both output and export volumes. Total industrial output expands marginally by 0.1 percent.

Service. The service sector appears to benefit the most from the tariff reduction. The decline in composite prices for both agricultural and industrial products brings about increased activity in wholesale and trading as well as "other services". Because of this, the entire sector's output and export increases by 0.2 and 3.4 percent respectively.

Factor remuneration. Factor income decreases as return to capital and overall wage declines by 2.3 and 2.6 percent, respectively (Table 6). Resources reallocate from the agriculture towards industrial and especially, service sector. All these interactions leads to a decline in price of value added. However, the reduction in the price of value added in agriculture is much higher than that of industry because of the output contraction in the former. Nevertheless, value-added reallocations towards banana in agriculture and semiconductor, and textile and garments in industry occur as both sub-

sectors expand. Both the value-added price and demand increases for the service sector, effectively pulling resources toward itself.

Labor Market. In general, labor demand increases in services, but falls in both agriculture and industry. Displaced agricultural laborers were absorbed by industry the services sector as latter's labor utilization increases (0.7 percent). Closer examination of table 3 reveals that changes in intra- rather than inter-sector labor demand accounts for much of the variation in the labor market. For instance, agricultural laborers move towards expanding sub-sectors such as banana, coconut, and fishing, while production laborers shift towards semiconductor, textile and garments, and motor vehicles in industry. Moreover, a significant insight that can be gleaned from evaluating table 5 and 6 is that variations in labor demand depend considerably on changes in each sub-sector's output. That is, the higher the output expansion, the higher the additional labor demand would be.

Household income. Factor income of all households decline (Table 7). This is due to the reduction in the price of value added which consequently results in a lower return to capital and wages. Agriculture-dependent households experience the highest reduction in factor income as the sector's contraction leads to a reduction in skilled and unskilled agricultural wages (2.8 percent), return to capital (2.7 percent), and return to land (3.6 percent).

As expected, rural households who are largely dependent on agriculture suffer because of this. Having specialized earning patterns, they are much more sensitive to changes in unskilled wages and returns to self-employment. Moreover, their limited skill hampers them from moving towards the expanding industrial and services sectors. As such, they find it difficult to enjoy the income gains from freer trade.

On the other hand, household income from unskilled production labor and returns to capital in services increase. The latter is due to the output-expansion and resource-reallocation effects accruing to the services sector whereas the former results from the increased demand for labor in industry as a result of industrial output expansion. Table 3 indicates that unskilled production laborers previously working in agriculture moved towards expanding sub-sectors such as semiconductor, textile and garments, motor vehicles, fertilizer, and coconut processing.

It should be noted however that the absorption capacity of the manufacturing sector to accommodate workers displaced in agriculture has been minimal due to the manufacturing sector's inherent production structure, concentrating on import-dependent and assembly-type operation with minimal value-added content. In fact, average growth of unskilled and skilled production-labor utilization in manufacturing was a mere 1.2- and 0.6-percent increase, respectively, compared to a 2.6- and 3.2-percent decline in agriculture (skilled and unskilled) labor utilization.

Poverty. Table 8 presents the changes in the FGT poverty indices. Recall that poverty in the Philippines is likely influenced by spatial factors, human capital (or educational attainment), and household head. National-poverty headcount decreases by 0.41 percent, which is roughly equivalent to 112,601 households being lifted out of poverty. However, both the national poverty gap and severity increases marginally implying that the poor become poorer. This is also observable in the rural areas though in stark contrast to urban areas where all poverty indices fall.

Rural households are worse off compared to their urban counterparts. In particular, rural households experience the lowest poverty-headcount reduction and the highest increase in poverty gap and severity. Poverty indices fall for almost all urban

households with those residing in NCR clearly reaping the highest poverty reduction as most industries are located within the area.

Highly-educated household heads benefit the most from tariff reduction because of their ability to move towards sectors offering higher returns. Indeed, all poverty indices for highly-educated household heads decline with the exception of highly-educated, male-headed households in NCR. This is due to the fall in highly-educated male income as a result of a contraction in sub-sectors utilizing it.

It seems that female-headed households respond well to trade liberalization compared to their male-headed counterparts as the reduction in poverty headcount among female-headed household is higher (1.7 for female against 0.2 for male). As noted previously, female-headed households are better off because of the expansion in semiconductors, textile and garments, and wholesale and retail trade sub-sectors which mainly employ highly-educated/skilled female workers. Moreover, some female headed households experience an increase in real income as the real exchange rate depreciation increases the domestic equivalent of the remittances they receive from husbands working abroad.

6.1.2 Full Tariff Elimination

The results of the full tariff elimination scenario are similar, but greater in magnitude compared to the actual tariff reduction scenario. Since the mechanisms driving the model results are essentially the same, this section only focuses on the significant gleaned from the second scenario.

The macroeconomic impacts of full tariff elimination (table 4) are greater relative to the actual tariff elimination scenario. The Local price of imported goods decreases by 4 percentage points more resulting in a substantial reduction in local import prices. This

generates high import volumes effectively reinforcing imported goods' capability to crowd out locally produced products. Thus, consumers substitute cheaper imports for domestic products further, particularly in agriculture. As a result, agricultural output contracts twice as much (from 0.5 percent compared to 0.2 percent in the first simulation). Nonetheless, domestic cost of production fall more making exports a lot more competitive in the international market.

The amount of labor displaced in agriculture is twice as many, though the services sector generates a hefty increase in labor demand successfully pulling displaced agricultural laborers into it. In contrast, the contraction in over-all industrial labor demand is less in this scenario.

The Changes in household income sources (table 7) once again confirms agricultural workers' sensitivity to changes in unskilled wages and returns to self-employment. Agriculture-dependent households experience the highest reduction in factor income as the sector's contraction leads to a reduction in skilled and unskilled agriculture wages (5.3 percent), return to capital (5 percent), and return to land (6.5 percent).

The reduction in the national poverty headcount is lower with 0.23 percent or 63,169 people lifted out of poverty (Table 8). The increase in the poverty gap and severity (0.8 and 1.2) is also higher under this scenario. This is traceable to the deeper contraction in agriculture thereby resulting in a larger reduction in factor income among agriculture dependent households. Households residing in rural areas experience an increase in poverty headcount, while the poverty gap and severity of poverty for all urban households not residing in NCR increases.

7. Conclusion

The two policy experiments conducted in this paper generate similar outcome. Tariff reduction leads to a decline in local import prices, inducing consumers to substitute cheaper imported agricultural products for their domestic counterparts. Similarly, tariff reduction brings about cheaper intermediate inputs and drives the domestic cost of production down, benefiting the outward-oriented and import-dependent industrial sector as output and exports increases. The manufacturing sector's labor absorption capacity to accommodate displaced agricultural laborers is negligible. This is because of the inherent manufacturing production structure in the country which focuses on import-dependent and assembly-type operations with minimal value-added content. Instead, most displaced laborers were absorbed by the services sector.

This study focused on two transmission channels linking trade and poverty. These are changes in: (1) consumer prices; and (2) consumer income. Between the two, we found that the former dominates the latter as tariff reduction significantly reduces consumer prices in the Philippines. The national poverty headcount decreases marginally as the reduction in consumer prices outweighed the income reduction for a majority of households. However, both the poverty gap and severity worsen marginally implying that the poor become poorer. In contrast, poverty indices in most urban areas, particularly NCR, decrease significantly owing from their proximity to major industries.

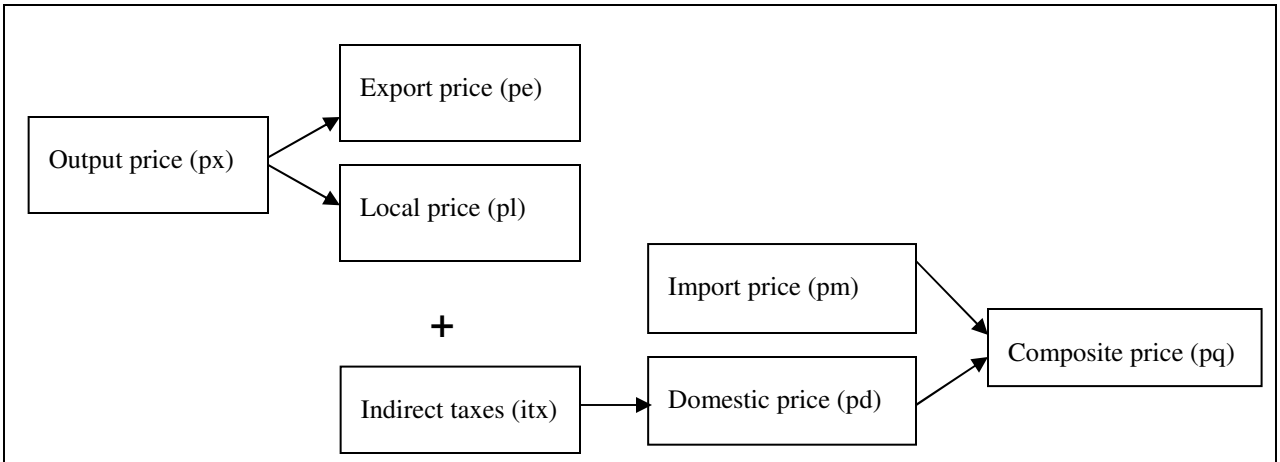
The actual tariff reduction between 1994 and 2000 appears to have marginally reduced the number of poor in the Philippines, while increasing the degree of poverty among those who remain poor. Similarly, the results obtained in the full tariff elimination scenario also suggest the same story.

In conclusion, the simulation results indicate that trade openness has a pro-urban and anti-rural bias. Thus, the challenge for the country and its policy makers is to

maximize the gains and minimize the losses by implementing complementary policies focused on two important considerations. First, policy directions towards increasing value-added utilization and encouraging forward and backward linkages in the manufacturing sector must be explored. This will not only allow the country to take advantage of the surplus agricultural labor but will also create new opportunities for displaced agricultural laborers. Second, there is a need to institute programs aimed at correcting inter- and intra-regional imbalances. This should be undertaken in conjunction with programs designed towards the improvement of human capital especially those in the rural areas, as the simulation results confirms that skill and education proves to be the best ally against poverty in the Philippines.

Figures

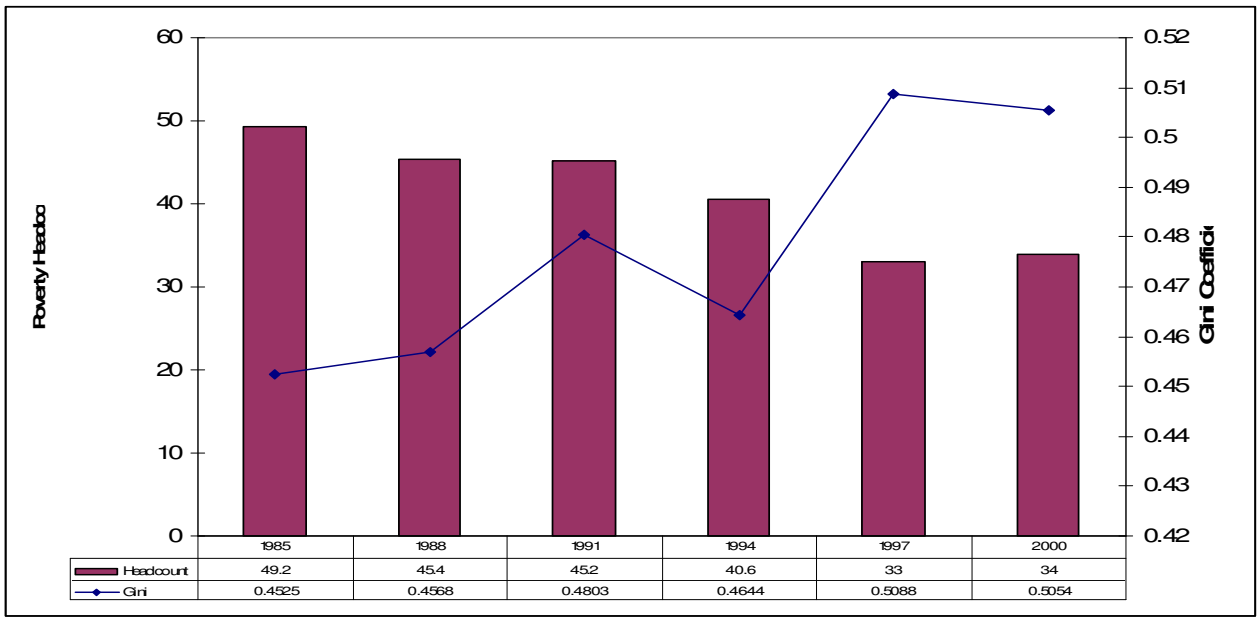
Figure 1. Basic price relationships in the model



Prices:

Domestic export price: Pe = Pwe · er	where: Pwe – world export price; er – exchange rate
Output price: Px = (Pe · E + Pl · D)/X	where: Pl – local producer price for domestic sales; E – exports; D – Domestic good
Domestic Consumer Price: Pd = Pl · (1+itxr)	where: itxr – indirect tax rate
Import Price: Pm = Pwm · er · (1+tm) · (1+itxr)	where: Pwm – world import price; tm – tariff rate
Composite Price: Pq = (Pd · D + Pm · M)/Q	where: M – import; Q – composite commodity

Figure 2: Income Distribution and Poverty: The Philippines (1985 - 2000)



Tables

Table 1. Elasticities and parameters

SECTORS	Foreign Trade						Production		
	Trade Elasticities***		Exports,% *		Imports,% *			VA Share	Lab-Cap
	Armington	CET	Share	Intensities+	Share	Intensities ++	$(VA/X)_i$	(VA_i / VA)	Ratio* *
Irrigated Palay (Rice)	5.05	5.05	-	-	0.001	0.01	73.9	2.0	1.0
Non irrigated Palay (Rice)	5.05	5.05	-	-	-	-	93.0	0.8	2.1
Corn	1.30	1.30	0.01	0.2	0.2	3.2	79.7	1.1	2.2
Banana	1.85	1.85	1.3	56.2	-	-	62.9	0.5	3.0
Fruits	1.85	1.85	0.8	12.4	0.2	3.6	75.9	1.5	1.7
Coconut	1.85	1.85	0.4	9.9	-	-	86.5	1.1	2.9
Sugarcane	2.70	2.70	--	-	-	-	71.9	0.6	1.2
Other agricultural crops	3.25	3.25	0.7	6.1	0.1	1.2	78.4	2.8	1.5
Hog	2.00	2.00	-	-	0.3	3.4	56.1	1.7	1.2
Chicken, egg and other poultry products	2.00	2.00	0.004	0.04	0.04	0.4	55.6	1.8	1.0
Other livestock	1.53	1.53	0.02	0.4	0.03	0.5	74.0	1.4	0.5
Fishing	1.25	1.25	3.4	20.8	0.03	0.2	71.7	3.8	0.6
Other Agriculture	3.38	3.38	--	-	0.2	3.4	77.0	1.0	2.3
AGRICULTURE			**6.5**	**7.5**	**1.1**	**1.3**		**20**	**1.1**
Mining	6.34	6.34	2.5	43.1	8.9	72.0	55.0	1.0	0.9
Meat Processing	4.17	4.17	0.1	0.5	0.5	2.6	28.5	1.5	0.3
Canning and preserving of fruits and vegetables	2.00	2.00	1.4	28.8	0.1	3.5	36.9	0.6	0.8
Fish canning and processing	4.40	4.40	2.1	39.6	0.02	0.7	24.5	0.4	0.7
Coconut processing	2.00	2.00	3.0	62.0	0.3	14.3	22.3	0.4	0.9
Rice and corn milling	2.60	2.60	0.04	0.2	0.2	1.0	32.3	2.5	0.3
Sugar milling and refining	2.70	2.70	0.4	8.9	0.2	4.8	30.1	0.4	0.9
Beverages, Sugar, Confectionery and related products	1.42	1.42	0.2	3.8	0.2	3.6	45.7	0.8	0.5
Other food manufacturing	2.40	2.40	1.3	5.6	4.4	15.3	29.3	2.3	0.9
Textile and garments	3.79	3.79	10.8	47.4	6.9	35.3	36.3	2.7	0.7
Wood, and paper products	3.16	3.16	3.6	27.5	5.0	33.5	34.8	1.5	0.6
Fertilizer	3.30	3.30	0.5	43.0	1.5	66.1	33.5	0.1	0.4
Other chemicals	3.30	3.30	1.8	11.8	10.8	43.4	40.7	2.0	0.4
Petroleum related products	2.10	2.10	1.1	5.6	4.1	17.1	20.2	1.3	0.5
Metal and related products	3.63	3.63	5.9	44.0	8.7	52.1	23.7	1.0	0.4
Semi-conductors and other electronic products	4.40	4.40	13.3	70.6	12.5	68.0	24.9	1.5	0.6
Motor vehicles and other machineries	3.70	3.70	6.0	34.7	27.5	69.7	19.8	1.1	0.7
Other manufacturing	3.42	3.42	5.3	30.1	7.1	35.0	37.6	2.2	0.9
Construction and utilities	2.34	2.34	0.5	1.0	-	-	52.9	8.3	0.6
INDUSTRY			**59.7**	**21.2**	**98.9**	**29.5**		**31.6**	**0.6**
Wholesale trade	1.90	1.90	14.3	20.9	-	-	64.1	14.2	0.5
Other service	1.90	1.90	19.5	14.6	-	-	61.4	26.6	0.4
Government services	1.90	1.90	--	-	-	-	69.0	7.7	-
SERVICES			**33.8**	**14.3**	**-**	**-**		**48.5**	**0.7**
TOTAL			**100.0**	**16.5**	**100**	**15.7**		**100**	**0.7**

*Based on the 1994 SAM; **Lab-Cap is labor-capital ratio; + Export as a percentage of sectoral output; ++ Import as a percentage of composite good; *** Based on GTAP (Hertel, 2004)

Table 2. Sources of household income (at the base)

Factors	All	All Female	Highly Educated Female	Low Educated Female	All Male	Highly Educated Male	Low Educated Male
Labor	45.4	36.5	40.5	33.0	47.1	46.6	47.5
Capital	35.8	31.7	35.8	28.1	36.5	39.0	34.5
Other Income	18.8	31.9	23.7	38.9	16.4	14.4	18.1

Note: Household heads with at least a high school diploma are considered highly educated

Table 3. Poverty Indices (at the base)

FGT Poverty Index	All	All Female	Highly Educated Female	Low Educated Female	All Male	Highly Educated Male	Low Educated Male
All Philippines							
Headcount	41.0	27.31	37.23	8.46	43.00	55.04	20.03
Gap	13.94	8.65	12.04	2.19	14.69	19.38	5.72
Severity	6.37	3.84	5.40	0.88	6.72	9.01	2.35
National Capital Region (NCR)							
Headcount	10.40	5.83	10.72	2.76	11.44	18.87	7.72
Gap	2.01	1.16	2.39	0.38	2.21	3.78	1.42
Severity	0.60	0.38	0.82	0.10	0.65	1.14	0.41
All Urban							
Headcount	30.49	19.92	28.00	6.44	32.06	43.36	16.71
Gap	9.73	5.78	8.35	1.49	10.31	14.62	4.46
Severity	4.25	2.33	3.39	0.55	4.54	6.57	1.78
All Rural							
Headcount	57.09	44.85	49.98	21.87	58.47	64.73	34.60
Gap	20.25	15.03	16.92	6.58	20.83	23.43	10.95
Severity	9.47	6.97	7.89	2.81	9.75	11.07	4.72

Table 4. Macroeconomic effects (in percent Changes)

Macroeconomic Variables	Actual	Full
Nominal tariff rate	-67	-100
Prices:		
Import prices (in local currency)	-8	-11.8
Consumer prices	-2.2	-3.9
Local cost of production	-3.7	-6.3
Real exchange rate	4.6	7.7
Import volume	11.6	19
Export volume	10.4	17
Domestic production (for local sales)	-2.2	-3.6
Consumption (composite) goods	0.5	0.7
Overall output	0.09	0.12

Table 5. Effects on prices and volumes

SECTORS	Price Changes (%)					Volume Changes (%)				
	δpm_i	δpd_i	δpq_i	δpx_i	δpl_i	δm_i	δe_i	δd_i	δq_i	δx_i
Actual Tariff Reduction										
Irrigated Palay (Rice)	-14.6	-2.6	-2.6	-4.5	-4.5	92.4	-	-1.0	-1.0	-1.0
Non irrigated Palay (Rice)	-	-3.1	-3.1	-5.0	-5.0	-	-	-1.0	-1.0	-1.0
Corn	-16.0	-2.7	-3.4	-4.6	-4.6	18.7	4.2	-1.9	-1.0	-1.9
Banana	-	-3.4	-3.4	-2.2	-5.3	-	11.7	1.1	1.1	7.1
Fruits	-18.7	-2.2	-3.4	-3.6	-4.2	39.4	7.2	-0.9	1.3	0.1
Coconut	-	-2.3	-2.3	-3.8	-4.2	-	9.5	1.2	1.2	2.0
Sugarcane	-	-3.7	-3.7	-5.6	-5.6	-	-	-4.0	-4.0	-4.0
Other agricultural crops	-7.5	-2.2	-2.3	-3.9	-4.1	18.5	13.5	-1.1	-0.8	-0.2
Hog	-15.4	-2.8	-3.5	-4.7	-4.7	29.5	-	-2.1	-0.6	-2.1
Chicken, egg and other poultry products	-5.4	-2.2	-2.2	-4.1	-4.1	6.2	7.9	-0.8	-0.7	-0.8
Other livestock	-11.3	-3.1	-3.1	-5.0	-5.0	13.4	7.1	-1.0	-0.9	-0.9
Fishing	-4.4	-1.2	-1.2	-2.5	-3.1	4.3	4.2	0.1	0.2	1.0
Other Agriculture	2.0	-1.7	-1.6	-3.6	-3.6	-11.5	-	0.3	-0.1	0.3
AGRICULTURE	**-12.0**	**-2.3**	**-2.5**	**-3.9**	**-4.2**	**21.2**	**7.3**	**-0.9**	**-0.5**	**-0.2**
Mining	-4.8	-2.3	-4.2	-2.2	-4.2	4.5	15.7	-11.7	0.2	0.3
Meat Processing	-22.9	-3.2	-4.4	-5.0	-5.1	150.9	20.4	-3.1	2.4	-2.9
Canning and preserving of fruits and vegetables	-17.4	-1.6	-2.5	-2.5	-3.5	40.1	6.0	-1.3	0.5	0.8
Fish canning and processing	-19.7	-0.2	-0.5	-1.3	-2.1	154.4	7.2	-2.5	-1.1	1.4
Coconut processing	-19.8	-4.1	-7.7	-2.2	-6.0	34.6	6.5	-5.8	1.6	1.9
Rice and corn milling	-20.8	-1.4	-1.8	-3.3	-3.3	74.9	8.2	-0.9	0.1	-0.9
Sugar milling and refining	-26.9	-2.9	-5.7	-4.4	-4.8	103.2	8.1	-5.5	2.1	-4.2
Beverages, Sugar, Confectionery and related products	-10.5	-1.7	-2.1	-3.5	-3.6	13.8	5.0	-0.4	0.2	-0.2
Other food manufacturing	-11.3	-2.3	-4.1	-4.0	-4.2	22.2	7.5	-3.0	1.4	-2.4
Textile and garments	-15.8	-6.3	-10.8	-3.9	-8.1	32.0	21.5	-11.9	6.1	4.3
Wood, and paper products	-11.2	-4.6	-7.3	-4.6	-6.5	15.8	14.2	-7.6	1.2	-1.5
Fertilizer	1.7	0.8	1.4	-0.6	-1.1	-1.1	5.5	1.6	-0.2	3.3
Other chemicals	-7.5	-4.2	-5.8	-5.3	-6.1	7.6	17.8	-4.3	1.3	-1.6
Petroleum related products	-1.3	-1.3	-1.3	-3.0	-3.2	-0.3	6.7	-0.3	-0.3	0.1
Metal and related products	-7.7	-3.5	-6.0	-2.9	-5.4	8.9	13.4	-7.4	1.6	1.9
Semi-conductors and other electronic products	-6.1	-2.5	-5.1	-1.2	-4.4	8.8	12.5	-7.8	3.9	6.6
Motor vehicles and other machineries	-5.3	-3.4	-4.8	-3.3	-5.3	3.6	17.8	-3.7	1.6	3.9
Other manufacturing	-17.5	-7.2	-12.1	-6.0	-9.0	28.3	18.4	-14.2	3.5	-4.1
Construction and utilities	0.0	-2.1	-2.1	-4.0	-4.1	-	8.9	-1.2	-1.2	-1.1
INDUSTRY	**-8.0**	**-2.9**	**-4.7**	**-3.7**	**-4.8**	**11.5**	**14.6**	**-3.9**	**1.3**	**0.1**
Wholesale trade	-	-0.2	-0.2	-1.7	-2.1	-	3.3	-0.8	-0.8	0.1
Other service	-	0.02	0.02	-1.7	-1.9	-	3.5	-0.3	-0.3	0.3
Government services	-	-	-	-2.3	-	-	-	-	-	-
SERVICES	**-**	**-0.04**	**-0.04**	**-1.7**	**-2.0**	**-**	**3.4**	**-0.4**	**0.2**	**0.2**
Full Tariff Reduction										
AGRICULTURE	**-25.7**	**-4.4**	**-5**	**-7**	**-7.6**	**66.2**	**13.9**	**-1.7**	**-0.6**	**-0.5**
INDUSTRY	**-11.6**	**-4.6**	**-7.3**	**-5.9**	**-7.8**	**18.5**	**23.5**	**-6.3**	**1.9**	**0.2**
SERVICES	**-**	**-0.3**	**-0.3**	**-3**	**-3.6**	**-**	**6.2**	**-0.9**	**0.3**	**0.3**

Where: δ - change; i - sector; pm_i- import (local) prices; pd_i - Domestic prices (with tax); pq_i - composite commodity prices; px_i - output prices; pl_i - local prices (without tax); m_i – imports; e_i – exports; d_i - domestic sales; q_i - composite commodity; x_i - total output

Table 6. Effects on the factor market

SECTORS	Value Added Changes (%)		δr_i, (%)	Change (%) in Labor Demand				
	δva_i	δpva_i		Total Labor	Skilled Agriculture	Unskilled Agriculture	Skilled Production	Unskilled Production
ACTUAL TARIFF REDUCTION								
Irrigated Palay (Rice)	-1.0	-5.6	-6.5	-1.9	-1.8	-1.8	-4.3	-4.9
Non irrigated Palay (Rice)	-.09	-5.2	-6.1	-1.5	-1.4	-1.4	-3.9	-4.5
Corn	-1.9	-5.3	-7.1	-2.9	-2.5	-2.5	-4.9	-5.5
Banana	7.1	-2.4	4.5	9.3	9.8	9.8	7.0	6.4
Fruits	0.1	-4.3	-4.2	0.1	0.6	0.6	-1.9	-2.5
Coconut	2.0	-4.2	-2.3	2.2	2.7	2.7	0.1	-0.6
Sugarcane	-4.0	-7.5	-11.2	-6.9	-6.8	-6.8	-9.1	-9.7
Other agricultural crops	-0.2	-4.5	-4.7	-0.4	0.1	0.1	-2.4	-3.0
Hog	-2.1	-5.9	-7.9	-3.8	-3.3	-3.3	-5.7	-6.3
Chicken, egg, and other poultry products	-0.8	-5.0	-5.7	-1.5	-1.0	-1.0	-3.5	-4.1
Other livestock	-0.9	-6.0	-6.9	-2.7	-2.2	-2.2	-4.6	-5.2
Fishing	1.0	-2.5	-1.5	2.8	3.5	3.5	0.9	0.2
Other Agriculture	0.3	-4.2	-3.9	0.4	1.0	1.0	-1.6	-2.2
AGRICULTURE	**-0.2**	**-4.6**	**-4.7**	**-0.4**				
Mining	0.3	-1.7	-1.5	0.5	-	-	0.8	0.2
Meat Processing	-2.9	-10.4	-13.1	-11.3	-	-	-11.0	-11.5
Canning and preserving of fruits and vegetables	0.8	-1.0	-0.2	1.9	-	-	2.2	1.5
Fish canning and processing	1.4	-0.2	1.2	3.3	-	-	3.6	3.0
Coconut processing	1.9	0.2	2.2	4.2	-	-	4.6	3.9
Rice and corn milling	-0.9	-5.0	-5.8	-3.9	-	-	-3.6	-4.2
Sugar milling and refining	-4.2	-6.7	-10.6	-8.8	-	-	-8.5	-9.0
Beverages, Sugar, Confectionery and related products	-0.2	-2.4	-2.6	-0.6	-	-	-0.3	-0.9
Other food manufacturing	-2.4	-4.8	-7.1	-5.1	-	-	-4.9	-5.4
Textile and garments	4.3	4.0	8.4	10.6	-	-	11.0	10.3
Wood, and paper products	-1.5	-4.2	-5.6	-3.7	-	-	-3.4	-4.0
Fertilizer	3.3	6.2	9.7	12.0	-	-	12.3	11.7
Other chemicals	-1.6	-6.2	-7.6	-5.7	-	-	-5.4	-6.0
Petroleum related products	0.1	-1.9	-1.9	0.2	-	-	0.5	-0.1
Metal and related products	1.9	2.3	4.3	6.4	-	-	6.7	6.1
Semi-conductors and other electronic products	6.6	9.4	16.6	19.0	-	-	19.4	18.7
Motor vehicles and other machineries	3.9	3.3	7.3	9.5	-	-	9.8	9.2
Other manufacturing	-4.1	-6.4	-10.2	-8.4	-	-	-8.1	-8.6
Construction and utilities	-1.1	-3.8	-4.9	-2.9	-	-	-2.6	-3.2
INDUSTRY	**-0.2**	**-2.6**	**-2.8**	**-0.4**				
Wholesale trade	0.1	-2.1	-2.0	0.2	-	-	0.3	-0.3
Other service	0.3	-1.1	-0.8	1.1	-	-	1.6	1.6
Government services		-2.3			-	-	-	-
SERVICES	**0.2**	**-1.4**	**-1.2**	**0.7**				
TOTAL		**-2.5**	**-2.3**					
Change in average wage, % -->				**-2.6**	**-4.8**	**-4.8**	**-2.3**	**-1.7**
FULL TARIFF ELIMINATION								
AGRICULTURE	**-0.4**	**-8.4**	**-8.5**	**-0.8**				
INDUSTRY	**-0.2**	**-4.3**	**-4.5**	**-0.3**				
SERVICES	**0.3**	**-2.8**	**-2.5**	**0.9**				
TOTAL	**-0.06**	**-4.5**	**-4.1**					
Change in average wage, % -->				**-4.7**	**-8.8**	**-8.8**	**-4**	**-3**

Where: δ - change; i - sector; va_i - value added; pva_i - value added prices; r_i - rate of return to capital

Table 7. Sources of household income (percentage changes)

Factors		ACTUAL TARIFF REDUCTION							FULL TARIFF ELIMINATION						
		All	All Female	Highly Educated Female	Low Educated Female	All Male	Highly Educated Male	Low Educated Male	All	All Female	Highly Educated Female	Low Educated Female	All Male	Highly Educated Male	Low Educated Male
Labor	Agriculture Skilled	-2.8	-3.3	-	-3.6	-2.7	-	-3.0	-5.3	-6.3		-6.7	-5.1	-	-5.7
	Agriculture Unskilled	-2.8	-3.4	-3.1	-	-2.7	-2.4	-	-5.3	-6.3	-5.8	-	-5.1	-4.5	-
	Industry Skilled	-0.3	-0.9	-	-1.1	-0.2	-	-0.5	-0.3	-1.3		-1.8	-0.1	-	-0.7
	Industry Unskilled	0.3	-0.3	0.01	-	0.4	0.8	-	0.6	-0.4	0.2	-	0.8	1.5	-
Capital	Agriculture	-2.7	-3.2	-3.0	-3.5	-2.6	-2.2	-2.9	-5.0	-6.0	-5.5	-6.4	-4.8	-4.2	-5.4
	Industry	-0.8	-1.4	-1.1	-1.5	-0.7	-0.3	-0.9	-0.9	-1.9	-1.3	-2.3	-0.7	0.1	-1.2
	Services	0.8	0.3	0.5	0.03	0.9	1.3	0.6	1.2	0.2	0.7	-0.3	1.4	2.1	0.8
	Land	-3.6	-4.1	-3.8	-4.3	-3.5	-3.1	-3.8	-6.5	-7.3	-6.9	-7.8	-6.3	-5.6	-6.9
Other Income	Dividends	2.1	1.5	1.8	1.2	2.2	2.5	1.9	3.8	2.8	3.3	2.3	4.0	4.7	3.4
	Others	2.1	1.5	1.8	1.2	2.2	2.5	1.9	3.8	2.8	3.3	2.3	4.0	4.7	3.4

Table 8. Percentage change in poverty indices (percentage changes)

	ACTUAL TARIFF REDUCTION							FULL TARIFF ELIMINATION						
	All Philippines							All Philippines						
FGT Poverty Index	All	All Female	Low Educated Female	Highly Educated Female	All Male	Low Educated Male	Highly Educated Male	All	All Female	Low Educated Female	Highly Educated Female	All Male	Low Educated Male	Highly Educated Male
Headcount	-0.4	-1.7	-1.4	-4.3	-0.3	-0.3	-0.2	-0.2	-2.9	-2.5	-5.9	0.01	0.1	-0.6
Gap	0.1	-1.1	-1	-2.8	0.2	0.2	-0.4	0.8	-1.3	-1	-4.3	0.9	1.1	0
Severity	0.2	-1.1	-1	-2.4	0.3	0.4	-0.3	1.2	-1.2	-0.9	-3.5	1.4	1.6	0.3
	National Capital Region (NCR)							National Capital Region (NCR)						
Headcount	-1.6	-9.5	-9.7	-9.1	-0.7	-1.8	0.7	-1.6	-6.3	-5.1	-9.1	-1.	-2.6	0.8
Gap	-1.6	-2.5	-2.3	-3.4	-1.5	-1.9	-1.1	-2.5	-3.5	-3.4	-4.5	-2.4	-2.8	-2
Severity	-2	-2.6	-2.7	-2.9	-1.8	-2.3	-1.2	-3.2	-4.2	-4.4	-4.8	-2.9	-3.5	-2
	All Urban Households (except NCR)							All Urban Households (except NCR)						
Headcount	-0.8	-2.2	-2.4	-0.6	-0.7	-0.7	-0.6	-0.7	-3.1	-2.7	-5.7	-0.5	-0.1	-1.7
Gap	-0.3	-1.7	-1.5	-3.6	-0.1	0	-0.7	0.2	-2.5	-2.1	-5.7	0.4	0.6	-0.7
Severity	-0.1	-1.7	-1.6	-3.6	0.09	0.2	-0.6	0.7	-2.3	-2	-5.8	0.9	1.2	-0.3
	All Rural Households							All Rural Households						
Headcount	-0.2	-1	-0.5	-5.3	-0.1	-0.1	-0.1	0.01	-2.6	-2.3	-5.3	0.2	0.3	-0.03
Gap	0.2	-0.8	-0.7	-2.4	0.3	0.4	-0.1	1.1	-0.8	-0.6	-3.6	1.2	1.3	0.6
Severity	0.4	-0.8	-0.7	-1.9	0.5	0.5	-0.04	1.5	-0.7	-0.5	-2.7	1.7	1.8	0.8

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[1] This involved modeling each household explicitly in the CGE model. The household data is sourced from the 1994 Family Income and Expenditure Survey (FIES) of the Philippines.

[2] Winters, 2000; Hertel and Reimer, 2004

[3] Discussion in this section is mainly based from Intal and Power (1990). See also Cororaton et al. (2006) and Cororaton and Corong (2006).

[4] The bound tariff rate is the tariff level that a WTO-member country commits not to exceed.

[5] The tariff peak is the proportion of products with tariffs exceeding the three times the mean tariff; the coefficient of variation is the ratio of the standard deviation to the mean.

[6] The FGT poverty measure (Foster, Greer, Thorbecke, 1984) is:

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^\alpha$$

where α is the poverty aversion parameter, n is the population size, q is the number of people below the poverty line, y_i is income, and z is the poverty threshold. The FGT poverty measure depends on the values that the parameter α takes. At $\alpha = 0$, the poverty headcount is calculated by accounting for the proportion of the population that falls below the poverty threshold. At $\alpha = 1$, the poverty gap is measured indicating how far on the average the poor are from the poverty threshold. Finally, at $\alpha = 2$, the poverty-severity index is revealed. The severity index is more sensitive to the distribution among the poor as more weight is given to the poorest below the poverty threshold. This is because the poverty-severity index corresponds to the squared average distance of income of the poor from the poverty line, giving more weight to the poorest of the poor in the population.

[7] All vehicles are assembled using completely-knocked-down (CKD) parts

[8] The Philippines does not produce all items in the semiconductor sector but instead imports these items. For example, it does not have the facilities to produce wafers (motherboards) and monitors which are major parts of computers. Domestic production focuses on hard disks, disk drives, processors, and some chips. Thus, while there is substantial domestic production and exports in the semiconductor sector, there are also substantial imports.

[9] This period was chosen because the policy reversals (tariff recalibration) that started during the end of the millennium resulted in the current nominal tariff rates not being significantly different from their levels in 2000

[10] Goods which are initially tax-exempt are not burdened by this tax.

[11] The share of *palay* imports at the base is almost zero.

[12] These are meat processing; canning and preserving of fruits and vegetables; fish canning and processing; coconut processing; rice and corn milling; sugar milling and refining; beverages, sugar, confectionary, and related products; and other food manufacturing.