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Doha Scenarios, Trade Reforms, and Poverty in the Philippines: A Computable General Equilibrium Analysis

by

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Abstract

Since the early 1980s, the Philippines has undertaken substantial trade reform. The current Doha Round of WTO negotiations is now likely to bring further reform and shocks to world import prices and export demand. The impact of all these developments on the poor is not very clear and is the subject of very intense debate.

A detailed economy-wide Computable General Equilibrium (CGE) model is used to run a series of policy experiments. Poverty is found to increase slightly with the implementation of the prospective Doha scenario. These effects are focused primarily among rural households in the wake of falling world prices and demand for the Philippines' agricultural exports.

The impacts of full liberalization – involving free world trade and complete domestic liberalization – are found to depend strongly on the mechanism the government adopts to offset forgone tariff revenue. If an indirect tax is used, the incidence of poverty falls marginally, but the depth (poverty gap) and severity (squared poverty gap) increase substantially. If, instead, an income tax is used, all measures of poverty increase. In both cases, full liberalization favors urban households, as exports, which are primarily non-agricultural, expand.

In separate simulations, we discover that free world trade is poverty reducing and favors rural households, whereas domestic liberalization is poverty increasing and favors urban households. Under free world trade, rural households benefit from increasing world agricultural demand. The anti-rural bias of domestic liberalization stems from the fact that import prices fall more for agricultural goods than for industrial goods, as initial import-weighted average tariff rates are higher for the former.

In conclusion, the current Doha agreement appears likely to slightly increase poverty, especially in rural areas and among the unemployed, self-employed and rural low-educated. The Philippines is found to have an interest in pushing for more ambitious world trade liberalization, as free world trade holds out promise for reducing poverty.

Introduction

Since the early 1980s, the Philippines has undertaken substantial trade reform: tariff rates have been reduced, tariff structures simplified, and quantitative restrictions converted to tariffs. The current Doha Round of WTO negotiations is now likely to bring major changes for the Philippines, particularly its agriculture sector, as well as pressure for further liberalization of its trade policies. The impact of all these developments on the poor is the subject of very intense debate. Will the outcome of the Doha Round, together with further Philippine trade liberalization, be favorable or harmful for the poor? Will the effects differ between different types of poor? What alternative or accompanying policies may be used 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? In order to answer these challenging questions, we employ a 35-sector CGE model with an emphasis on the agricultural sector. This is consistent with the agricultural focus of the Doha Round, and the strong concerns about the potential impacts of Doha on Philippine agricultural products of special interest to the poor.

There have been numerous attempts to adapt CGE models to the analysis of income distribution and poverty issues. Many authors impose strong assumptions concerning the distribution of income among households in each category. A popular approach is to assume a lognormal distribution of income within each category where the variance is estimated with the base year data (De Janvry, Sadoulet, and Fargeix 1991). In the spirit of this same approach, Decaluwé *et al* (2000) argue that a beta distribution is preferable to other distributions because it can be skewed left or right and thus may better represent the types of intra-category income distributions commonly observed. Regardless of the assumed distribution, the CGE model is

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used to estimate the change in the average income for each household category, while the variance of this income is assumed fixed.

In this paper, we instead utilize the actual distribution of income within our 12 household categories, based on the 1994 Family Income and Expenditure Survey (FIES) of 24,797 Filipino households, without imposing a fixed functional form. The 12 household categories are obtained by grouping households by region (urban-rural), the education of the household head and this individual's occupation. Changes in average household income are derived for each household category from the CGE model and then applied to all corresponding households in the FIES to compute changes in household welfare and poverty.

1. Background

1.1 Agricultural Stagnation

The agricultural sector employs about 35 percent of the Philippine labor force and accounts for roughly 20 percent of GDP. If linkages with agricultural-related sectors, including food processing and the farm supply industry, are added to this total, the farm and food-related industry contributes 40 percent of GDP and employs two-thirds of the labor force (David 1997). This sector has been characterized by low rates of productivity increase and correspondingly low growth rates in the last two decades. Growth decelerated from an annual average of 6.7 percent in the 1970s to 1.1 percent in the first half of the 1980s. Although the second half of the 1980s saw some recovery, agriculture again lost steam in the 1990s with an annual growth rate of just 2 percent.

The Green Revolution was the main driving force behind the high growth in the 1970s. However, because of an inherent policy bias against agriculture, coupled with the collapse in

world commodity prices, this momentum was not sustained. David (2003) concludes that the negative impact of the government's anti-agriculture policy bias was even greater than that of declining world commodity prices. The policy bias towards import substitution and against agriculture and exports led to market distortions which promoted rent seeking activities and distorted economic incentives against investments in agriculture up to the 1970s. Moreover, the policy of maintaining an overvalued exchange in support of industrial policy greatly penalized and reduced the rates of return to agriculture during this period (Intal and Power 1990).

Agriculture exports were a major source of foreign exchange in the country in the 1970s. The sector as a whole was a net exporter, contributing two-thirds of total exports and representing only 20 percent of total imports, thereby providing the foreign exchange needed to support the import dependent manufacturing sector (Intal and Power 1990). However, the 1990s saw a clear change in agricultural trade patterns as farm exports stagnated and imports increased dramatically to the point that the Philippines became a net importer of agricultural goods. David (2003) attributes this evolution to the country's fading comparative advantage and low productivity levels in agriculture.

1.2 Post World War II Trade Policies

The balance of payments (BOP) crisis that transpired barely four years after World War II shaped the Philippine industrial and agricultural policy landscape. High import demand for the purposes of economic reconstruction, coupled with distressed local production, led to a decline in international reserves and the 1949 BOP crisis. This spurred a policy response centered on import and foreign exchange controls through the identification of essential imports, the imposition of import quotas, as well as the government allocation of scarce foreign exchange.

Though initially intended to be a temporary measure, 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.

Import Substitution

The enactment of the highly protective 1957 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. This created a strong bias against agriculture and exports. An analysis of effective protection rates (EPR) by sector and commodity (Power and Sicat 1971; Tan 1979) revealed that the highest EPRs from the 1950s to 1970s were granted to import substituting consumer industries; in contrast agriculture and primary (mining) products, which accounted for two-thirds of exports during the period, were characterized by the lowest EPRs. The weighted average EPR provided to the manufacturing sector was 44 percent in 1974 compared to a much lower 9 percent protection for agriculture and mining. In spite of the passage of the revised 1973 tariff code, which was primarily aimed at decreasing tariff dispersion, a large disparity in tariff levels persisted, especially by South East Asian standards.

Export Taxes on Agriculture

Agricultural export taxes ranging from 4 to 10 percent were introduced following the 1970 devaluation to stabilize the BOP position. Initially intended to be temporary, the agricultural export tax ended up being incorporated into the 1973 tariff and customs code as a major source of government revenue. The world commodity prices boom in 1974 prompted the imposition of an additional export tax to enhance government revenue. Not surprisingly, this worsened the bias against agriculture, resulting in additional resource reallocation from

agriculture to other sectors of the economy, particularly towards the import substituting consumer goods sector (Intal and Power 1990). Furthermore, the dispersion in tariff rates openly encouraged assembly operations that focused mainly on the production of import dependent, low value added products. Overall, these policies not only prevented the growth of the agricultural and primary sectors, they also discouraged the development of desirable backward integration (Bautista and Tecson 2003).

Overvaluation of the Exchange Rate

The overvalued exchange rate arising from the highly protective trade policy regime also contributed to the bias against agriculture. This occurred despite the removal of exchange rate controls in 1960 and the de facto devaluations of 1962 and 1970. The overvaluation of the peso varied significantly, from 14 percent over the 1962-66 period, to as high as 32 percent from 1975 to 1979 (Intal and Power 1990). The overvaluation of the exchange rate resulted in negative protection rates for rice, sugar and coconut, ranging from -13 percent to -33 percent. This, too, significantly reduced the returns to agricultural production (Intal and Power 1990).

Government Intervention

Government interventions in the input markets further exacerbated the anti-agriculture bias. The input prices of fertilizers, hand tractors, and irrigation pumps were higher than their corresponding world prices by 10, 33 and 30 percent, respectively (David 1983). Government pricing and marketing interventions in agriculture, purportedly aimed at protecting the domestic economy from instability in world commodity prices, led to the establishment of government marketing agencies that had monopoly power for imports and monopsony power for exports. In reality, they siphoned off the gains from trade by diverting proceeds from agricultural producers and creating rent-seeking activities (Bautista and Tecson 2003). In particular, heavy restrictions

on trading of food grains (rice, corn, and wheat), coconut and sugar reduced domestic prices. For instance, the government controlled the allocation between exports and domestic sales of sugar, with domestic sales forced to sell at below-world prices. The establishment of a de facto government-funded coconut 'parastatal' with substantial monopsony power took advantage of the favorable international market at the expense of domestic coconut producers. Similarly, a government food grain marketing agency reduced the returns to domestic producers as the agency controlled the domestic price of food grains.

1.3 Philippine Trade Reform

This pattern of intervention in the Philippine economy was unsustainable and it is hardly surprising that reforms became necessary. The first phase of the trade reform program (TRP) started in the early 1980s with three major components: (a) the 1981-85 tariff reduction; (b) the import liberalization program (ILP); and (c) the complimentary realignment of the indirect taxes. During this period maximum tariff rates were reduced from 100 to 50 percent and sales taxes on imports and locally produced goods were equalized. The mark–up applied on the value of imports (for sales tax valuation) was also reduced and eventually eliminated.

Implementation of the TRP was suspended in the mid–1980s because of a balance of payments crisis. In fact, some of the items that were deregulated earlier were re–regulated during the period. When the Aquino government took over in 1986, the TRP of the early 1980s was resumed, resulting in the reduction of the number of regulated items from 1,802 in 1985 to 609 in 1988. Export taxes on all products except logs were also abolished.

In 1991 the government launched TRP–II, which sought to realign tariff rates over a five–year period. The realignment involved the narrowing of the tariff rates through a reduction

of tariff peaks, with the goal of clustering tariffs within the 10-30 percent range by 1995. This resulted in a near equalization of protection for agriculture and manufacturing by the start of the 1990s, reinforced by the introduction of protection for "sensitive" agricultural products.

In 1992, a program of converting quantitative restrictions (QRs) into tariff equivalents was initiated. In the first stage, QRs of 153 commodities were converted into tariffs. In a number of cases, these tariff rates exceeded 100 percent, especially during the initial years of the conversion. However, a built–in program for reducing tariff rates over a five–year period was also put into effect. QRs were removed for a further 286 commodities in the succeeding stage. At the end of 1992 only 164 commodities were subjected to QRs. However, there were some policy reversals along the way. For example, in 1993, QRs were re-introduced for 93 items, largely as a result of the Magna Carta for Small Farmers in 1991.

In 1994, the government started implementing TRP–III at the same time as it was admitted to the WTO. Tariff rates were successively reduced on: capital equipment and machinery (January 1, 1994); textiles, garments, and chemical inputs (September 30, 1994); 4,142 manufacturing goods (July 22, 1995) and "non-sensitive" components of the agricultural sector (January 1, 1996). Through these programs, the number of tariff tiers was reduced, as were the maximum tariff rates. In particular, the overall program was aimed at establishing 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. This further reduced the anti-agriculture tariff bias which, by 1995 had turned into effective protection for agriculture. Indeed, EPRs in agriculture and industry went from 9 and 44 percent, respectively, in 1979 to 25

and 20 percent in 1999, and to 24 and 15 percent by the year 2000 (Bautista, Power and Associates 1979; Manasan and Pineda 1999; Habito 2002).

Between 1994 and 2000, the overall weighted nominal tariff declined by 66.9 percent, the declines ranging from 88.9% in mining through 64.0% for non-food manufacturing, 57.6 for livestock, 45.6 for crops to 19.9 for "other agriculture." In 2000, the average sectoral tariff rate was highest in food manufacturing (16.6 percent), and lowest in "other agriculture" (0.2 percent).

Revenue from import tariffs remains one of the major sources of government funds. In 1990, the share of revenue from import duties and taxes in total revenue was 26.4 percent. It increased marginally to 27.7 percent in 1995, but then dropped sharply to 19.3 percent in 2000, largely due to the tariff reduction program. The reduction in tariff revenue was largely replaced by an increase in income and profit taxes from 27.3 percent in 1990 to 30.7 percent in 1995 and 38.6 percent in 2000, with the excise and sales tax share fluctuating between 23 and 28 percent.

1.4 Poverty Profile in the Philippines

Figure 1 presents the evolution of the poverty headcount index and the Gini coefficient from 1985 to 2000. The poverty headcount index dropped continuously from 49.2 percent in 1985 to 36.9 percent in 1997, but then rebounded to 39.5 percent in 2000 as a result of the 1998 El Nino and the Asian Crisis. El Nino resulted in a 30 percent contraction in agriculture, the greatest drop in more than 30 years. On the other hand, income inequality has steadily increased over this period, as the Gini coefficient climbed from 0.42 in 1985 to 0.51 in 2000.

In 1994, the base year the household survey underlying our analysis, about 41 percent of the population of 67 million was below the poverty threshold. Generally, rural households, which represent roughly half the population, are substantially poorer than urban households. Whether in

urban or rural areas, households with low-educated heads are by far the poorest. These four

household categories (low-educated salaried and self-employed households in rural and urban

areas) combine to encompass more than 60 percent of the total population of the Philippines and

the bulk of the poor.[2]

2.   Model Specification

2.1 Basic Structure

The model of the Philippine economy used in this study has 35 production sectors, with

13 sectors for agriculture, fishing and forestry, 19 for industry, and three for service sectors,

including government service. In the agricultural sector, the model distinguishes capital, land and

four types of labor inputs: skilled (high education = high school diploma) and unskilled (low

education) agricultural labor, and skilled and unskilled production workers.[3] Agricultural

workers are employed only in agriculture, while the small number of production workers

employed in agriculture are mobile between the farm and non-farm sectors. Non-agricultural

sectors, except government service, use capital as well as skilled and unskilled production

worker inputs. Capital is sector-specific in this short-run closure. The demand for intermediate

inputs and value-added represents fixed proportions of total output, whereas the components of

value added are aggregated using a Cobb-Douglas function.

A CET function transforms local products into exports. Indirect taxes are added to the

local price to determine domestic prices, which, together with the import price, will determine

the composite price of domestically consumed goods via a CES price aggregator. All prices

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[2] Additional background information and data on trade and poverty in the Philippines is available in this paper.
[3] In this work, we have retained the sectoral labor disaggregation in the Labor Force Survey where some production workers are also employed in agriculture. One restrictive assumption we imposed was that only those production workers employed in agriculture can move to the other sectors given a change in the relative factor price.

adjust to clear the factor and product markets. Consumer demand is derived from Cobb-Douglas utility functions for each household in the model. A downward-sloping export demand curve is assumed in order to match up with the global model.

2.2 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 tariff cuts is compensated endogenously by the introduction of an additional uniform sales tax. The government's budget balance (public savings) is endogenously determined, although 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, 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 done through a factor in the household saving function that adjusts endogenously.

2.3 Economic Structure

Table 1 presents the basic structure and parameters of the model. The sectoral export demand curve elasticities used in the model are equal to the import-import Armington elasticities

of substitution estimated for the GTAP model (Hertel *et al* 2004). The sectoral CES and CET elasticities in the model in turn are assumed to be the same as the import-domestic Armington elasticities in the GTAP model. Total exports in 1994 were composed of 6.1 percent agriculture exports, 63.1 percent industrial exports, and 30.8 percent service sector exports. The principal industrial exports are semi-conductors, and textiles and garments. The semi-conductor industry is highly export intensive, followed by coconut processing, bananas and the textile-garment sector. 98.5 percent of total imports are industrial. The sectors which are most import-intensive are mining (75.3 percent; mainly due to crude oil imports), semi-conductors, machinery, and fertilizer[4]. While agriculture generally has a higher value-added ratio compared to industry, its contribution to domestic value added is smaller, 19.9 percent compared with industry's 31.5 percent and services' 48.5 percent. Labor intensity is uniformly higher in the agricultural sectors, with the exception of fishing and "other livestock".

3.   Definition of the Scenarios

In all Philippine simulation experiments, the calibrated tariff rates in the Philippine model, which are initially set at 1994 levels, are re-calibrated to the 2001 tariff rates used in the GTAP model for the Philippines. The solution of the model using the re-calibrated tariff rates serves as the base model to which all subsequent policy simulations are compared. For all but the last scenario, the GTAP world model is run separately to generate estimates of the resulting changes in world prices for Philippine exports and imports, demand for Philippine exports, and,

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[4] The Philippines does not produce all items in the semi-conductor 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 semi-conductor sector, there are also substantial imports.

in the case of the Doha scenarios, new Philippine tariff rates[5]. The following experiments are conducted and analyzed:

1. The core Doha scenario, with the indirect tax for revenue replacement

2. ROW free trade, full domestic liberalization[6] and indirect tax as replacement tax.

3. ROW free trade, full domestic liberalization and income tax as replacement tax.

4. ROW free trade, no domestic liberalization and indirect tax as replacement tax.

5. Full domestic liberalization, no ROW trade reform, and indirect tax as replacement tax.

Experiment (1) involves Doha-specified reductions in world and domestic tariff rates, export subsidies and domestic support. An indirect tax is introduced to compensate lost domestic tariff revenue. Scenarios (2) and (3) are the full (rest of world and domestic) liberalization scenarios, involving the elimination of all world and domestic import tariffs, under two alternative replacement tax schemes: indirect tax and income tax, respectively. Finally, scenarios (4) and (5) isolate the respective impacts of ROW and full domestic liberalization from scenario (2).

Table 2 summarizes the 2001 tariff rates for the Philippines, as well as the variations in world import and export prices, world export demand and Philippine import tariff rates as estimated by the GTAP world model. The export price and volume changes can be combined with a knowledge of the slope of the export demand schedule to compute the vertical shift in export demand that is used in the national model.

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[5] Tariff rate changes are derived from GTAP-estimated variations in the power of tariffs under Doha scenarios. If x is the tariff rate, the power of tariff is $p\_tm = (1 + x/100)$. GTAP generates results for p_tm, which in turn is used to compute the new tariff rate in the Philippine model.
[6] All domestic tariffs are set to zero.

Given the agricultural focus of the Doha negotiations, it is important to recall that almost all Philippine trade is industrial in nature, although food processing represents roughly 10 percent of exports (Table 1). With the exception of fruit, world export prices increase slightly (by less than 1 percent) under the Doha scenario, whereas variations are greater and more often negative, in the case of full liberalization. Much more substantial impacts are noted in terms of world demand for Philippine exports, particularly under full liberalization.[7] These impacts are strongly positive for Palay rice[8], textiles and garments and a number of food processing industries (meat/fish processing, sugar and beverages). However, they are moderately negative for several agricultural products (fruit, sugarcane and, in the case of the Doha scenario, livestock) and certain manufacturing and service sectors.

On the import side, world prices increase for almost all imports, with the strongest increases among agricultural goods and under full liberalization. The changes in Philippine tariff rates are minimal under the Doha scenario, as these reductions apply to bound tariff rates, which are much higher than the applied tariff rates presented in Table 2. Under the full liberalization scenario, all Philippine import tariffs are eliminated.

The net impacts of these changes on the agricultural sector, which is the source of income for most of the poor, are difficult to anticipate *a priori*. While world prices and demand fall for a number of agricultural exports, reduced import competition (higher world import prices) and increased world prices and demand for agro-industrial exports are likely to have positive effects on domestic demand for agricultural goods. We now turn our attention to the simulation results

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[7] These price changes are reported relative to the numeraire of constant world factor prices—see chapter 3. In general equilibrium only *relative* price changes matter, the 'average' price level effects being absorbed by the exchange rate. The price changes used for Cameroon also, of course, reflect the composition of Cameroon's trade flows in terms of the YY GTAP commodities used in chapter 3. The Philippines experiences falling agricultural export prices despite the increases in world prices because it loses preferences in both East Asia and the EU.

[8] As Palay rice exports were practically nil in the base year, these large percentage increases have no actual impact on the results.

from our CGE model to try to sort these (and other) different effects out and to determine the net poverty impacts.

3. Doha Results

3.1 Macro and Sectoral Effects

The macro effects of the Doha simulation are reported in the first column of Table 3. On average, export prices (0.41 percent) increase more than import prices (0.21 percent). Domestic producers increase their export volumes in response, and reduce their local sales. The combination of reduced local sales and increased import and export prices raises domestic consumer and output prices. As local prices increase relative to imports prices, Philippine consumers substitute toward imports.

At a sectoral level the Doha results suggest a reallocation of exports and production from the inward-oriented agricultural and service sectors toward the export-oriented industrial sectors. Table 2 presents the world import price, export price and export demand effects of the Doha scenario according to the 35 sectors of our CGE model. While world export prices and demand increase overall, they decline in the agricultural sector, as driven by declines in export demands for fruits and vegetables, fats and oils and rice. In the wake of the Doha reforms, Philippine exports of these products become relatively less competitive in several key markets, including: Japan, EU-15, Korea and Taiwan. For example, in the case of processed rice, Philippines has tariff-free access into the EU already, so that when tariffs on competitors are cut, the price of Philippine rice in the EU relative to the average import price for rice rises by 28 percent. Consequently there is little surprise that the Philippines loses export share in these markets.

In response to these shocks, Philippine agricultural producers reorient their sales towards the domestic market, while industrial producers turn increasingly to the export market. This development is reinforced by the greater increase in the world prices of agricultural imports relative to industrial imports (Table 5), which lead domestic consumers to substitute away from agricultural imports towards domestically-produced agricultural products. This also explains why consumer prices rise relatively in the agricultural sector. For output prices, however, the increase is greater in the industrial sector than in the agricultural or service sectors, and when we take account of larger input cost savings for industrial sectors, industrial sector value added prices increase much more (0.69 percent) than for the agricultural (0.42) or service sectors (0.38) (Table 4). Producers respond by reallocating agricultural and service output toward the industrial sector. Within the industrial sector, the food processing and textile-garments sectors emerge as the main "winners" from the Doha accord, given strong growth in world demand for these products.

3.2 Incomes and Poverty

All factor prices increase relative to the numeraire (the nominal exchange rate) as a result of rising world export demand under the Doha scenario (Table 5). However, these increases are somewhat smaller for factors used intensively in the agriculture and service sectors, given the general reallocation of production toward the industrial sector and rising relative output prices for industrial goods.

These variations in factor remunerations affect the income of different household groups according to their respective income shares (Table 6). We note that there is a stronger distinction between households headed by salaried workers (including civil servants) and those headed by the self/un-employed, than there is between urban and rural households. Whereas households

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with salaried heads derive most of their income from wages, households with self/un-employed heads are more dependent on capital and foreign income. Nonetheless, rural households do derive a somewhat larger share of income from agricultural factors (labor and agricultural capital), as compared to urban households. This is particularly true for rural households with low-educated heads, who represent nearly three-quarters of the rural population.

Household income changes for the various scenarios are summarized in Table 7. Rising factor remunerations under the Doha scenario translate into increases in income for all household groups. Rural and urban households have approximately equal gains on average, although the sources – agriculture vs. non-agricultural income – of these gains are quite different. Urban and rural households headed by salaried workers, including civil servants, gain most given the high share of (non-agricultural) production wages in their income. The sole exceptions are households headed by low-educated rural salaried workers – the second poorest household category – who rely heavily on unskilled agricultural wages. The incomes of urban and rural households headed by the self/un-employed also have smaller nominal income gains, given the smaller share of production wages and high shares of agricultural and service capital remuneration in their income.

In the FGT calculations, poverty effects come from two sources: (i) the change in household income; and (ii) the change in consumer prices, which affects the nominal value of the poverty line. The results of the calculations for the three poverty indices, headcount, gap, and severity, are presented in Table 8, along with data on initial values. The latter show that poverty in both rural and urban areas is highest for the low-educated households, which represent over 60% of the total population.

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Overall, poverty increases slightly under the Doha scenario, regardless of the indicator used. This deterioration is due to the fact that consumption prices rise more on average than household nominal incomes, primarily due to the small deterioration in terms of trade[9]. In general, rural households are somewhat more affected than urban households, as their nominal incomes increase by a lesser amount and their consumer price indices (not shown) increase slightly more. There is a strong contrast between households headed by the self/un-employed and rural households, for whom poverty increases, and those headed by salaried workers (including civil servants but excluding rural low-educated workers), for whom poverty declines. This is due to strong increases in production worker wages. The sole exceptions are households headed by low-educated rural wage workers, for whom poverty increases as a result of their reliance on unskilled agricultural wages. Indeed, the greater increase in rural poverty can be primarily traced to the contrasting impacts on low-educated workers in rural and urban areas (Table 6).

In summary, these scenarios suggest that the Doha scenario will increase poverty slightly for all household categories, as consumer prices rise more than household incomes. Poverty increases most among rural households and the urban self/un-employed. These results can be traced back to the finding from the GTAP world model that the Doha accord is likely to increase world prices and demand for Philippines' industrial exports, while reducing world prices and demand for Philippines agricultural exports. As a result, the inward-oriented agricultural and service sectors contract, while the export-oriented industrial sector expands. Whereas rural households suffer from the resulting fall in relative returns to agricultural factors, the urban self/un-employed suffer from declining returns to service-sector capital.

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[9] No major differences in consumption patterns are noted among household groups as all groups devote roughly 10 percent of their consumption to agricultural goods, 50-60 percent to industrial goods and 30-40 percent to services. Thus, we do not explore the differential consumption price effects for each household group.

4.   Full Liberalization Simulations

These simulations involve the complete elimination of import tariffs in the Philippines and the rest of the world (ROW). According to the GTAP world model, this would lead to increased world import prices and export demand, along with reduced world export prices (Table 2). We now turn to analyses of the macro, sectoral, household, and poverty effects.

4.1 Macro and Sectoral Effects

The macro impacts of the full liberalization scenarios are substantially larger than those of the Doha scenarios, regardless of the choice of replacement tax (Table 3). The elimination of domestic tariffs reduces domestic import prices by 2.41 to 3.23 percent despite increasing world import prices. At the same time, increased world demand for Philippine exports offsets falling world export prices such that domestic export prices rise by nearly 1 percent. In response, local producers reorient their production from the domestic market toward the export market at the same time as local consumers substitute toward cheaper imports. As local demand falls faster than local supply, local producer and consumer prices fall. The drop in local prices results in a depreciation in the real exchange rate of (1.68 percent), which reinforces the rise in exports and imports. When we compare the two replacement taxes, we note that import and consumer prices fall more when lost tariff revenue is replaced by the introduction of a uniform income tax, but that volume responses are roughly the same.

In order to compare sectoral results with those of the Doha simulations, Table 4 breaks down the price and volume effects by major sector for all scenarios. Full liberalization leads to a smaller contraction in agricultural exports, but a much larger increase in industrial exports due to greatly increased world demand for the Philippines' industrial exports. This is the main force driving the larger reallocation of domestic output, value added and labor from the agricultural

and service sectors toward the industrial sector. Output and, more starkly, value added prices also fall more in the agricultural sector, as a result of declining export prices. At the same time, full liberalization leads to substantial reductions in import prices, particularly for industrial imports. This leads to an increase in industrial imports and a strong reduction in consumer prices for industrial goods. In a more disaggregate analysis, we trace industrial output expansion primarily to the textile-garments sector and several food processing sectors (fish processing, coconut processing and fruit/vegetable canning).

When we substitute a compensatory income tax for the consumption tax, import, domestic sales and consumer prices all fall more given the absence of a price-increasing indirect tax. However, as producers no longer need to absorb part of the indirect tax, output and value added prices fall less and indeed increase in the case of industrial and service value-added prices. Domestic production is consequently reoriented more markedly from the service sector in favor of the industrial sector.

4.2 Incomes and Poverty

In the full liberalization scenario with a replacement indirect tax, all but unskilled wages drop, with the greatest reductions among agricultural factors (Table 5). This result can be traced primarily to the fall in domestic prices resulting from the removal of import tariffs. Agricultural factors lose most, as output is reoriented from the agricultural and service sectors toward the export-expanding industrial sector. Nominal factor remunerations fall less, and indeed increase in some cases, with the introduction a compensatory income tax, although the pro-industrial nature of the results remains intact. This can be explained by smaller domestic price reductions in the absence of a new indirect tax.

Under full liberalization with a compensatory indirect tax, all households suffer from declining nominal income with the exception of urban households headed by low-educated salaried workers (Table 7). The drop in income is more than five times greater for rural households than for urban households, because they rely on agricultural wages and/or agricultural capital, for which the rates of remuneration decline dramatically. Among rural households, it is precisely the poorest and most populous household categories – those with low-educated heads – who suffer most. Nominal income losses are even stronger when a compensatory income tax is used, despite the fact that nominal factor remuneration rates decline less and, in several cases, increase. This is because income tax is paid solely by households, whereas the indirect tax is shared among all domestic consumers. Contrast the changes in total and after-tax incomes in these cases. Although the difference between urban and rural households is smaller, the pattern of impacts among urban and rural households remains the same.

The poverty effects with full (world and domestic) trade liberalization and a compensatory indirect tax (scenario 2) are complex (Table 8). While the headcount index declines marginally by -0.02 percent, both the poverty gap and the severity indices increase. The urban-rural contrast is dramatic with urban poverty declining and rural poverty increasing in roughly the same proportions as a result of the adverse agricultural impacts of full liberalization. Indeed, poverty declines for most urban household groups, which are less tied to declining agricultural incomes, while it increases for most rural household groups. When a compensatory income tax is introduced instead, poverty increases for both urban and rural households, although more so among rural households.

In conclusion, full liberalization generally increases poverty more than the Doha agreement. However, poverty actually falls among urban households. This is primarily due to the adverse rural impacts as Philippine agricultural producers are confronted with lower priced imports, in the wake of full liberalization. The introduction of an income tax instead of an indirect tax to compensate lost tariff revenue results in greater poverty increases, as household bear the full weight of this tax.

5.   Disaggregating the Full Liberalization Scenario

In simulations 4 and 5, we break down the effects of eliminating all tariffs in the rest of the world (free world trade) and in the Philippines (domestic liberalization) from simulation 2.

5.1 Macro and Sectoral Effects

We observe dramatically opposing price effects in these two scenarios (Table 3). While prices uniformly increase under free world trade, primarily as a result of increased export demand and prices, they fall under the domestic liberalization scenario as a result of falling import prices. However, both simulations result in increased trade, due to increased export demand under free world trade and increased import competition and real exchange rate devaluation under domestic liberalization. Whereas ROW free trade boosts trade through increased world export prices and demand, domestic liberalization does so through reduced domestic import prices. These contrasting price effects generally offset each other when ROW and domestic liberalization are combined in simulation 2, whereas the export, import and consumption volume effects reinforce each other.

Contrasting results are also found in the sector analysis (Table 4). ROW liberalization leads to a reallocation of production from services to industry with agricultural output practically

unchanged, whereas domestic liberalization pushes production from agriculture and, to a lesser extent, industry toward services. These contrasting effects can be linked to the strong increase in industrial export prices under ROW liberalization, and increased competition from cheaper agricultural and industrial imports under domestic trade liberalization. Rising agricultural import prices lead to a greater increase in agricultural prices under ROW liberalization. In contrast, greater reductions in agricultural import and export prices bring down agricultural prices more than industrial and service prices with domestic liberalization.

5.2 Incomes and Poverty

The most dramatic contrast is observed in comparing the nominal factor remuneration effects of ROW and domestic liberalization (Table 5). ROW liberalization leads to strong increases in nominal factor remunerations, particularly for agricultural factors, as a result of increased import prices and export demand. In contrast, falling output and value added prices, particularly in the agricultural sector, under domestic liberalization lead to strong reductions in nominal factor remunerations for agricultural factors in particular.

ROW trade liberalization has strong positive effects on the nominal income of all household categories, particularly in rural areas, as agricultural factors are the biggest gainers (Table 7). In contrast, domestic liberalization reduces nominal income for all household categories, especially rural households. Once again, these results can be traced to the fall in factor remunerations, particularly among agricultural factors.

When we attempt to disentangle the impacts of ROW liberalization under scenario (4) and full domestic liberalization under (5), it becomes clear that the former is poverty-reducing, whereas domestic liberalization is poverty-increasing. This is due to the fact that the increases in nominal income (Table 7) outstrip the increase in the household CPI (Table 3) under ROW

liberalization, whereas nominal income and the household CPI fall equally with domestic liberalization. ROW and domestic liberalization also have contrasting urban-rural effects. Whereas the former reduces rural poverty and increases urban poverty, the contrary is true of the domestic liberalization scenario. These results can be traced to the anti-agricultural impacts of domestic liberalization and the pro-agricultural effects of trade reforms in the rest of the world.

6.   Conclusion

In this analysis of the poverty impacts of trade reform under the Doha Development Agenda, as well as more comprehensive trade reforms, we find mixed effects. Poverty increases slightly with the implementation of the expected Doha agreement, especially among rural households and the agricultural self/un-employed. These household categories include the poorest and most populous households in the Philippines. These results can be traced to the Doha-generated reduction in world prices and demand for the Philippines' agricultural exports and the resulting increase in industrial output and, consequently, production worker wage rates.

Full liberalization – involving ROW and domestic liberalization – with a compensatory indirect tax (to offset lost tariff revenue) reduces the incidence of poverty marginally, but increases the poverty gap and poverty severity substantially. Poverty increases in rural areas and falls in urban areas, as full liberalization favors non-agricultural sectors over agricultural sectors. When an income tax is used instead of an indirect tax, poverty increases more and in both rural and urban areas, although the increase is larger in rural areas.

In order to understand the full liberalization results, we run separate simulations for ROW trade and domestic liberalization, respectively. We discover that ROW reforms favor rural households and are poverty reducing, whereas domestic liberalization favors urban households

and is poverty-increasing. Under ROW trade reform, income gains outstrip consumer price increases, particularly for rural households, who derive most of their income from agricultural factors. Agricultural factor remuneration increases as consumers turn away from increasingly expensive agricultural imports and bid up the price of locally produced agricultural goods. In contrast, domestic liberalization leads to increased poverty as household income falls by more than consumer prices. Here, the anti-rural bias stems from the fact that import prices fall more for agricultural goods than for industrial goods.

In conclusion, the model and scenarios used in this paper suggest that the prospective Doha agreement may slightly increase poverty in the Philippines, especially in rural areas and among the unemployed, self-employed and rural low-educated. Based on these findings, we conclude that the Philippines has an interest in pushing for more ambitious trade liberalization in the rest of the world, as this holds out the promise of reducing poverty.[10] On the contrary, domestic liberalization is found to potentially increase poverty, due to its adverse impact on the rural sector. This suggests that combining domestic reforms with reforms in the rest of the world is an attractive proposition. Whereas ROW liberalization favors rural households and actually increases urban poverty, the opposite is true of domestic liberalization. This suggests that some regional compensatory policies might also be considered.

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[10] It might also indicate the Philippines' interest in extending serious liberalization to the movement of service providers (people), which is shown to be poverty-reducing in Bangladesh in chapter 15 below. The Philippines is a major supplier of migrant labour.

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**Figure 1: Income Distribution and Poverty: The Philippines
(1985 – 2000)**
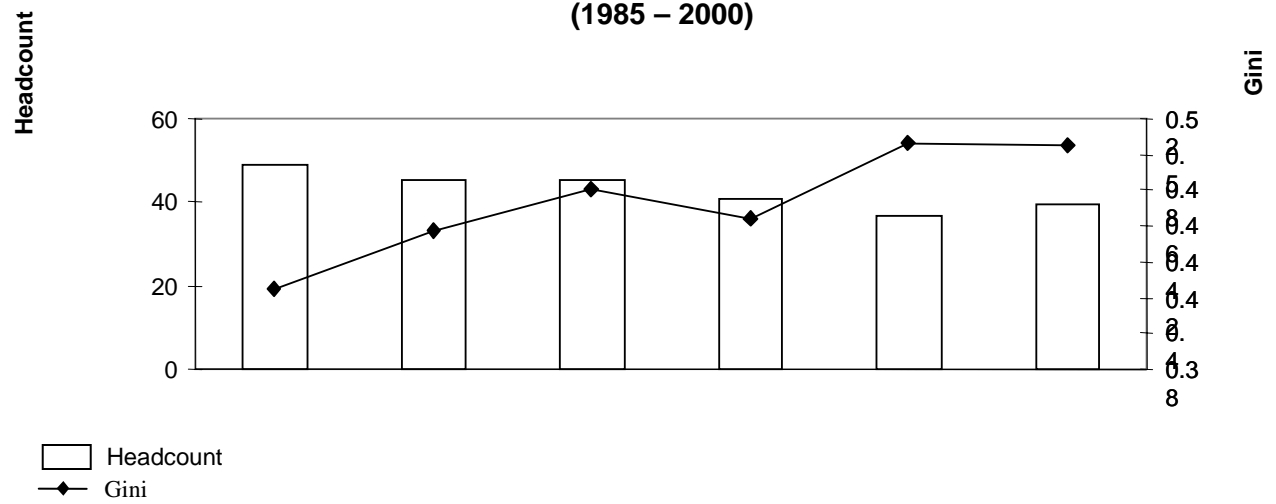
Source: FIES 1985, 1988, 1991, 1994, 1997, 2000

Table 1: Elasticities and Key Parameters (1994)

	GTAP Elasticities	Foreign Trade				Production (percent)		
		Exports (percent)*		Imports (percent)*			VA Share	Lab-Cap
		Share	Intensity	Share	Intensity	$(VA/X)_i$	(VA_i/VA)	Ratio**
Irrigated Palay	10.1			0.00	0.03	73.88	1.95	0.94
Non-irrigated Palay						92.98	0.83	2.07
Corn	2.6	0.01	0.24	0.16	3.86	79.73	1.09	2.15
Banana	3.7	1.25	58.96			62.94	0.49	3.28
Fruit	3.7	0.73	13.57	0.40	7.25	75.86	1.52	1.63
Coconut	3.7	0.36	10.74			86.53	1.07	3.02
Sugarcane						71.87	0.56	1.14
Other agricultural crops	6.5	0.67	7.08	0.17	1.70	78.36	2.81	1.46
Hog	4.0			0.57	6.46	56.05	1.59	1.09
Poultry products	4.0	0.00	0.05	0.04	0.43	55.57	1.83	0.96
Other livestock	3.1	0.02	0.40	0.03	0.61	74.04	1.39	0.50
Fishing	2.5	3.09	21.62	0.03	0.23	71.74	3.80	0.58
Other Agriculture	6.8			0.12	2.93	77.00	0.99	2.30
AGRICULTURE		**6.13**		**1.51**			**19.9**	
Mining	12.7	2.51	50.23	8.22	75.28	54.96	1.02	0.88
Meat Processing	8.3	0.09	0.66	0.97	6.37	28.46	1.43	0.30
Fruit/vegetable canning	4.0	1.36	30.80	0.18	5.34	36.90	0.60	0.87
Fish processing	8.8	2.03	41.93	0.03	1.04	24.51	0.42	0.75
Coconut processing	4.0	2.93	65.57	0.43	21.01	22.33	0.36	0.90
Rice & corn milling	5.2	0.03	0.17	0.19	0.89	32.32	2.44	0.29
Sugar milling & refining	5.4	0.38	9.80	0.26	6.56	30.11	0.43	0.85
Beverages, sugar, etc	2.8	0.20	4.03	0.20	3.89	45.73	0.83	0.53
Other food processing	4.8	1.31	6.24	4.81	19.09	29.25	2.22	0.80
Textile and garments	7.6	12.08	57.00	8.56	46.13	36.32	2.81	0.81
Wood/paper products	6.3	3.72	32.81	5.28	39.54	34.76	1.43	0.61
Fertilizer	6.6	0.49	42.25	1.24	64.00	33.47	0.14	0.48
Other chemicals	6.6	1.87	14.36	10.24	46.33	40.75	1.95	0.35
Petroleum products	4.2	1.09	5.96	3.48	16.75	20.19	1.32	0.48
Metal products	7.3	6.06	49.54	8.44	56.44	23.73	1.05	0.47
Semi-conductors	8.8	14.09	76.17	12.53	72.96	24.85	1.66	0.73
Machinery (inc. cars)	7.4	6.56	39.53	24.76	70.94	19.79	1.15	0.80
Other manufacturing	6.8	5.85	39.38	8.66	46.66	37.61	2.03	0.79
Construction/utilities	4.7	0.45	1.06			52.86	8.24	0.58
INDUSTRY		**63.10**		**98.49**			**31.5**	
Wholesale trade	3.8	12.99	21.74			64.06	14.24	0.51
Other service	3.8	17.78	15.20			61.44	26.64	0.37
Government services						69.02	7.67	
SERVICES		**30.77**					**48.54**	
TOTAL		**100.0**		**100.0**			**100.0**	

Notes: *: Export intensity is the ratio of exports to domestic production whereas import intensity is the ratio of imports to domestic consumption; **: Lab-Cap is the labor-capital ratio; VA: value added; X: output

Table 2: GTAP-Simulated World Prices and Demand Variations

	2001	Doha				Full Liberalization		
	GTAP Tariffs	World Export Price	Demand	World Import Price	New Tariff*	World Export Price	Demand	World Import Price
AGRICULTURE								
Irrigated Palay	20.9			3.6	20.9			8.3
Non-irrigated Palay								
Corn	25.7	0.2	3.8	1.9	22.6	-1.6	35.4	8.4
Banana		-0.2	-6.3			-1.9	-6.3	
Fruits	8.8	-0.2	-6.3	0.9	7.6	-1.9	-6.3	2.2
Coconut		-0.2	-6.3			-1.9	-6.3	
Sugarcane								
Other agricultural crops	4.7	0.3	-0.7	2.0	4.7	1.9	49.9	8.2
Hog	3.0			2.3	3.0			6.6
Poultry products	3.0	0.5	-7.9	2.3	3.0	-0.7	39.4	6.6
Other livestock	5.9	0.1	-0.4	1.4	5.0	-1.5	10.8	4.4
Fishing	4.1	0.4	0.3	0.5	4.1	1.4	2.5	2.1
Other Agriculture	0.1			0.6	0.1			1.8
INDUSTRY								
Mining	3.0	0.7	0.0	0.1	3.0	0.9	2.0	0.6
Meat Processing	17.8	0.2	41.3	0.7	14.3	-0.4	172.3	0.0
Fruit/vegetable canning	6.2	0.4	3.7	0.5	6.1	0.5	16.9	0.6
Fish processing	30.2	0.1	36.4	0.0	20.6	-0.4	170.8	-2.2
Coconut processing	6.2	0.4	3.7	0.5	6.1	0.5	16.9	0.6
Rice & corn milling	49.9	0.1	-36.0	0.1	49.9	-2.1	-24.6	6.8
Sugar refining	46.7	0.5	56.7	4.8	39.2	0.3	188.4	6.7
Beverages, sugar, etc	11.1	0.3	22.7	1.0	10.4	0.5	108.8	2.6
Other food processing	5.2	0.4	2.4	1.9	5.1	1.1	12.3	3.0
Textile and garments	6.5	0.5	11.0	0.4	6.5	-0.7	44.9	0.7
Wood/paper products	4.7	0.3	-1.9	0.3	4.7	0.6	3.8	1.1
Fertilizer	4.5	0.2	3.4	0.1	4.5	-0.6	28.6	0.4
Other chemicals	4.5	0.2	3.4	0.1	4.5	-0.6	28.6	0.4
Petroleum products	2.7	0.1	0.9	0.1	2.7	-2.0	13.3	-0.2
Metal products	3.9	0.3	-2.1	0.2	3.9	1.0	-3.7	0.6
Semi-conductors	0.1	0.2	-1.3	0.1	0.1	0.5	-3.4	0.4
Machinery (inc. cars)	3.9	0.2	-1.2	0.2	3.9	-0.3	9.0	0.5
Other manufacturing	5.1	0.4	-4.0	0.2	5.1	0.6	-2.0	0.9
Construction/utilities	0.0	0.3	-1.4			1.2	-3.6	
SERVICES								
Wholesale trade	0.0	0.3	-0.9			1.1	-1.6	
Other service	0.0	0.3	-1.2			1.7	-4.5	
Government services								

Table 3: Macro Effects (percent change from base)

| | Doha | Full Liberalization | | ROW vs. Domestic Liberalization (DL) | |
| | | Ind. Tax | Inc. Tax | ROW | DL |
	1	**2**	**3**	**4**	**5**
Change in Overall nominal tariff rate	0.00	-100.00	-100.00	0.00	-100.00
Domestic prices					
Imports	0.21	-2.41	-3.23	0.56	-2.94
Exports	0.41	0.91	0.90	1.55	-0.63
Domestically-sold output*	0.37	-0.01	-0.83	1.63	-1.61
Household CPI*	0.39	-0.33	-1.16	1.71	-2.00
Domestic output	0.41	-0.46	-0.42	1.79	-2.21
Real exchange rate change**	-0.01	1.68	1.68	-0.03	1.70
Domestic volumes					
Imports	0.15	4.37	4.35	0.74	3.61
Exports	0.13	3.88	4.05	0.24	3.63
Domestically-sold output	-0.01	-0.96	-0.93	0.00	-0.96
Total domestic consumption	0.03	0.16	0.17	0.15	0.01
Domestic output	0.02	0.04	0.10	0.05	-0.02

* = including indirect taxes; ** = World export price/domestic output price; Ind. Tax - indirect tax, Inc. Tax - income tax

Table 4: Effects on Prices and Volumes by Major Sector (percent change from base year)

	Prices						Volumes						
	Import	Export	Dom.	Cons.	Output	VA	Import	Export	Dom.	Cons.	Output	VA	Labor
1. Doha													
Agriculture	1.04	-0.34	0.45	0.46	0.42	0.42	-1.60	-2.12	0.16	0.12	-0.03	-0.02	-0.05
Industry	0.20	0.62	0.34	0.29	0.44	0.69	0.18	0.68	-0.08	0.02	0.12	0.11	0.33
Service		0.14	0.36	0.36	0.35	0.38		-0.48	-0.08	-0.08	-0.08	-0.08	-0.17
Total	**0.21**	**0.41**	**0.37**	**0.34**	**0.41**		**0.15**	**0.13**	**-0.01**	**0.03**	**0.02**		
2. Full liberalization: ROW and domestic liberalization with replacement indirect tax													
Agriculture	-0.43	-0.80	-0.07	-0.09	-0.91	-1.13	-1.21	-1.72	-0.02	-0.04	-0.17	-0.12	-0.21
Industry	-2.44	1.38	-0.40	-1.20	-0.55	-0.06	4.45	6.02	-1.77	0.48	0.24	0.16	0.65
Service		0.33	0.53	0.53	-0.20	-0.21		0.85	-1.77	-0.14	-0.14	-0.14	-0.29
Total	**-2.41**	**0.91**	**-0.01**	**-0.53**	**-0.46**		**4.37**	**3.88**	**-0.96**	**0.16**	**0.04**		
3. Full liberalization: ROW and domestic liberalization with replacement income tax													
Agriculture	-1.27	-0.71	-0.72	-0.74	-0.72	-0.54	-0.85	-1.97	-0.02	-0.04	-0.19	-0.14	-0.26
Industry	-3.26	1.33	-1.36	-2.10	-0.64	1.06	4.43	6.37	-1.65	0.55	0.43	0.29	1.02
Service		0.38	-0.21	-0.21	-0.10	0.43		0.65	-1.65	-0.24	-0.24	-0.24	-0.50
Total	**-3.23**	**0.9**	**-0.83**	**-1.35**	**-0.42**		**4.35**	**4.05**	**-0.93**	**0.17**	**0.1**		
4. ROW liberalization													
Agriculture	5.11	0.28	2.33	2.39	2.35	2.67	-5.56	-5.32	0.48	0.34	0.00	0.01	0.02
Industry	0.50	1.98	1.40	1.10	1.71	2.51	0.83	1.71	-0.26	0.13	0.25	0.21	0.65
Service		0.95	1.61	1.61	1.65	1.84		-1.49	-0.26	-0.19	-0.19	-0.19	-0.39
Total	**0.56**	**1.55**	**1.63**	**1.43**	**1.79**		**0.74**	**0.24**	**0.00**	**0.15**	**0.05**		
5. Domestic liberalization													
Agriculture	-5.23	-1.09	-2.34	-2.42	-3.17	-3.68	4.62	3.90	-0.53	-0.42	-0.16	-0.12	-0.22
Industry	-2.91	-0.59	-1.77	-2.26	-2.23	-2.56	3.60	4.25	-1.50	0.36	-0.03	-0.07	-0.04
Service		-0.62	-1.05	-1.05	-1.82	-2.01		2.38	-1.50	0.06	0.06	0.06	0.13
Total	**-2.94**	**-0.63**	**-1.61**	**-1.93**	**-2.21**		**3.61**	**3.63**	**-0.96**	**0.01**	**-0.02**		

Notes: Dom=Domestic sales of local production; Cons. = Consumption (domestic); VA = Value added

Table 5. Effects on Factor Remunerations (percent change from base year)

	Wage rates				Land	Return to capital			
	Agriculture*		Non-agriculture						
Scenarios	Skilled	Unskilled	Skilled	Unskilled	rent	Agriculture	Industry	Service	All
1. Doha	0.31	0.31	0.56	0.61	0.30	0.53	0.74	0.30	0.49
2. Full Liberalization (Indirect tax)	-1.49	-1.49	-0.01	0.30	-2.08	-0.87	-0.18	-0.34	-0.37
3. Full Liberalization (Income. tax)	-0.91	-0.91	0.87	1.21	-1.48	-0.33	1.06	0.20	0.42
4. ROW Liberalization	2.45	2.45	2.25	2.34	2.46	2.98	2.66	1.65	2.20
5. Domestic Liberalization	-3.80	-3.80	-2.23	-2.02	-4.41	-3.74	-2.83	-1.95	-2.53

*The returns to skilled and unskilled labor in agriculture move in lock-step due to the assumption of equal factor intensities across agricultural sub-sectors (due to a lack of information).

Table 6: Sources of Household Income at the base (percent)

	Urban						Rural					
	Salaried		Civil	Self-employed		Family	Salaried		Civil	Self-employed		Family
Sources	low-ed	hi-ed	servants	low-ed	hi-ed	bus.	low-ed	hi-ed	servants	low-ed	hi-ed	bus.
Skilled ag. labor	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.5	6.4	0.0	7.4	6.0
Unskilled ag. labor	0.0	0.0	0.0	0.0	0.0	0.0	61.9	0.0	0.8	18.9	0.0	7.5
Skilled prod. labor	0.0	66.3	62.2	0.0	26.1	8.6	0.0	51.1	59.8	0.0	20.2	4.9
Unskilled prod. labor	66.5	0.0	3.7	22.1	0.0	2.8	19.3	0.0	5.2	10.2	0.0	4.4
Capital in Agriculture	1.2	0.5	0.9	10.8	2.0	5.3	2.7	1.4	3.9	30.1	17.5	29.8
Capital in Industry	0.8	0.8	0.4	2.9	1.9	12.0	0.6	0.4	0.4	2.1	1.8	5.6
Capital in Service	17.7	15.2	18.5	38.2	34.9	54.0	7.0	8.8	9.5	16.7	22.3	22.9
Land Rent	0.6	0.4	1.3	1.8	1.4	1.1	0.9	0.9	3.0	3.1	3.1	2.9
Dividends	4.0	10.1	4.1	3.8	13.9	8.7	0.6	2.2	3.1	2.1	7.3	6.1
Government Transfers	5.1	3.2	3.7	9.9	7.0	3.3	3.3	3.2	3.6	7.8	8.3	3.9
Foreign Income	4.1	3.5	5.3	10.4	12.8	4.2	3.6	2.5	4.3	9.2	12.1	5.8
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

Legend: Low-ed – zero education to third year high school; hi-ed – high school graduate and up; ag. – agriculture; prod. – production; bus. – business.

Table 7: Changes in Household Income and Sources (percent change from base)

Household type	Doha	Full Liberalization (ind. tax)	Full Liberalization (inc. tax)		ROW Liberalization	Domestic Liberalization
	Total	Total	Total	After tax	Total	Total
Urban	**0.37**	**-0.11**	**0.48**	**-1.35**	**1.64**	**-1.73**
Low-ed salaried	0.47	0.12	0.84	-0.94	1.92	-1.78
Hi-ed salaried	0.43	-0.07	0.61	-1.29	1.79	-1.83
Civil servants	0.44	-0.09	0.61	-1.25	1.86	-1.93
Low-ed self/un-employed	0.33	-0.19	0.33	-1.44	1.60	-1.75
Hi-ed self/un-employed	0.28	-0.17	0.30	-1.50	1.31	-1.45
Family business	0.35	-0.24	0.35	-1.46	1.66	-1.86
Rural	**0.37**	**-0.60**	**-0.04**	**-1.79**	**2.01**	**-2.55**
Low-ed salaried	0.35	-0.93	-0.33	-2.04	2.21	-3.04
Hi-ed salaried	0.42	-0.50	0.19	-1.58	2.09	-2.54
Civil servants	0.45	-0.22	0.49	-1.32	2.00	-2.18
Low-ed self/un-employed	0.36	-0.61	-0.11	-1.84	2.01	-2.55
Hi-ed self/un-employed	0.32	-0.39	0.09	-1.67	1.65	-2.00
Family business	0.38	-0.56	-0.02	-1.82	2.04	-2.54
Total	**0.37**	**-0.28**	**0.31**	**-1.50**	**1.77**	**-2.00**

Notes: ind. tax = Indirect tax; inc. tax = Income tax; Low-ed – zero education to third year high school; Hi-ed – high school graduate and up.

Table 8: Poverty Indices: initial value and percent change from base under alternative scenarios)

	Share of population	Base 1994	Doha	Full liberalization		ROW Liberalization	Domestic Liberalization
				Ind. tax	Inc. tax		
			%chng	%chng	%chng	%chng	%chng
	1	2	3	4	5	6	7
Headcount Index							
Urban	**49.7**	**28.0**	**0.02**	**-0.46**	**0.26**	**0.10**	**-0.49**
Low-ed salaried	9.6	41.7	0.00	-0.85	-0.33	0.00	-0.47
Hi-ed salaried	9.4	15.5	-0.22	-0.48	0.30	-0.43	-0.22
Civil servants	4.7	10.2	0.00	0.00	0.00	0.00	0.00
Low-ed self/un-employed	14.0	42.3	0.10	-0.27	0.50	0.15	-0.52
Hi-ed self/un-employed	9.2	16.9	0.00	-0.43	0.76	0.76	-0.97
Family business	2.8	18.2	0.00	0.00	0.80	0.00	0.00
Rural	**50.3**	**53.2**	**0.05**	**0.20**	**0.65**	**-0.29**	**0.58**
Low-ed salaried	9.7	58.7	0.00	0.30	0.83	-0.68	1.32
Hi-ed salaried	2.8	31.3	0.00	1.02	1.55	-0.98	1.55
Civil servants	2.4	22.4	0.00	-0.81	0.00	-1.36	0.00
Low-ed self/un-employed	26.8	61.0	0.04	0.20	0.61	-0.17	0.40
Hi-ed self/un-employed	5.0	37.5	0.32	0.00	0.73	0.32	0.00
Family business	3.6	39.9	0.00	0.00	0.00	-0.19	0.00
Total	**100.0**	**40.7**	**0.04**	**-0.02**	**0.52**	**-0.16**	**0.21**
Poverty Gap							
Urban	**49.7**	**8.9**	**0.02**	**-0.55**	**0.26**	**0.07**	**-0.60**
Low-ed salaried	9.6	12.9	-0.15	-1.10	-0.62	-0.32	-0.74
Hi-ed salaried	9.4	3.7	-0.16	-0.67	0.62	-0.38	-0.27
Civil servants	4.7	2.5	-0.16	-0.56	0.52	-0.60	0.08
Low-ed self/un-employed	14.0	14.9	0.10	-0.32	0.47	0.24	-0.57
Hi-ed self/un-employed	9.2	4.8	0.23	-0.31	1.02	0.87	-1.16
Family business	2.8	6.0	0.05	0.07	0.93	-0.08	0.15
Rural	**50.3**	**18.4**	**0.09**	**0.47**	**1.17**	**-0.48**	**0.91**
Low-ed salaried	9.7	19.7	0.12	1.01	1.56	-0.78	1.75
Hi-ed salaried	2.8	9.7	-0.05	0.29	0.86	-0.79	1.10
Civil servants	2.4	6.8	-0.15	-0.24	0.40	-0.71	0.50
Low-ed self/un-employed	26.8	21.9	0.08	0.36	1.07	-0.40	0.72
Hi-ed self/un-employed	5.0	12.0	0.15	0.05	1.03	0.12	-0.09
Family business	3.6	12.0	0.05	0.45	1.45	-0.70	1.12
Total	**100.0**	**13.7**	**0.07**	**0.14**	**0.88**	**-0.30**	**0.42**
Poverty Severity							
Urban	**49.7**	**3.9**	**0.00**	**-0.66**	**0.28**	**0.08**	**-0.74**
Low-ed salaried	9.6	5.6	-0.18	-1.28	-0.71	-0.37	-0.87
Hi-ed salaried	9.4	1.3	-0.15	-0.74	0.67	-0.45	-0.30
Civil servants	4.7	0.9	-0.22	-0.65	0.54	-0.65	0.11
Low-ed self/un-employed	14.0	6.9	0.13	-0.41	0.58	0.29	-0.71
Hi-ed self/un-employed	9.2	2.1	0.24	-0.34	1.06	0.92	-1.26
Family business	2.8	2.8	0.04	0.07	1.04	-0.11	0.18
Rural	**50.3**	**8.4**	**0.11**	**0.58**	**1.47**	**-0.61**	**1.14**
Low-ed salaried	9.7	8.8	0.15	1.27	1.96	-0.97	2.19
Hi-ed salaried	2.8	4.3	-0.05	0.35	0.99	-0.92	1.27
Civil servants	2.4	2.9	-0.17	-0.28	0.49	-0.84	0.59
Low-ed self/un-employed	26.8	10.3	0.11	0.46	1.37	-0.51	0.94
Hi-ed self/un-employed	5.0	5.0	0.20	0.08	1.36	0.16	-0.12
Family business	3.6	5.2	0.06	0.50	1.64	-0.79	1.27
Total	**100.0**	**6.2**	**0.08**	**0.19**	**1.10**	**-0.39**	**0.55**

Source: 1994 Family Income and Expenditure Survey and authors' simulations.
Legend: low-ed – zero education to third year high school; hi-ed – high school graduate and up.