



**RESEARCH PAPER
SERIES No. 2002-03**

**Trade Reforms, Income Distribution
and Welfare: The Philippine Case**

Caesar B. Cororaton



PHILIPPINE INSTITUTE FOR DEVELOPMENT STUDIES
Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

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The author, Dr. Caesar B. Cororaton, is a senior research fellow of the Philippine Institute for Development Studies. His areas of expertise include applied general equilibrium modeling, total factor productivity estimation, and trade and poverty analysis.

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Please address all inquiries to

Philippine Institute for Development Studies
NEDA sa Makati Building, 106 Amorsolo Street
Legaspi Village, 1229 Makati City, Philippines
Tel: (63-2) 893-5707 / 892-4059
Fax: (63-2) 893-9589 / 816-1091
E-mail: publications@pidsnet.pids.gov.ph
Website: <http://www.pids.gov.ph>

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Abstract

In the past one and a half decades, the Philippine government pursued major economic policy reforms. One of the key focused areas is the trade sector. Policy reforms included tariff reduction, simplification of tariff structure, and tariffication of quantitative restrictions. While some of the reforms were pursued unilaterally, others were done under various multilateral agreements such as the World Trade Organization (WTO), and regional agreements under the Association of Southeast Asian Nations (ASEAN) such as the ASEAN Free Trade Area (AFTA). This paper aims to analyze the effects of the trade reforms, particularly tariff policies, on income distribution and welfare. The paper employs a computable general equilibrium (CGE) model calibrated to Philippine data in the analysis.

I



The Philippine Economy: Growth Performance and Basic Structure

The last 35 years saw a “roller coaster” Philippine economic growth performance. Growth was highest during the 1973-1982 period, averaging 5.5 percent per year (Table 1). While considered by many as the peak period of the Marcos regime, such excellent performance was not sustained, however, as dissatisfaction among Filipinos on the military regime mounted and eventually led to a political uprising in the following period, 1983-1985. The political crisis triggered an economic crisis that resulted in an economic collapse. During that period, the economy contracted by -4.1 percent per year. The Marcos administration was finally forced out in the early part of 1986, which gave way to the Aquino government.

In the following period, 1986-1990, the euphoria under the new government brought about economic recovery. Growth averaged 4.5 percent per year during that period. Toward the end of the Aquino administration, however, the political tug-of-war led to a series of military coup attempts. Although these attempts failed, they created political uncertainties and instability. These, together with the series of natural calamities and the energy crisis, brought the economy to a halt in 1991-1993. During that period, the economy contracted again by -0.1 percent per year.

The new government after Aquino was able to revive the economy. Under the Ramos leadership, growth averaged 4.9 percent per year from 1994 to 1997. But this improvement was short-lived. The combined effects of the Asian financial crisis that began in 1997, the El Niño in late 1997 that prevailed until 1998 and severely affected agricultural production, and the political scandals in the Estrada administration took a

heavy toll on the economy. Growth slid to 3.5 percent per year in 1998-2000. Indeed, the last 35 years was a period of boom-and-bust growth cycle. Political as well as weak economic fundamentals were believed to be the major forces behind such dismal performance.

The country's employment performance was, however, generally not as disappointing. Employment growth was averaging more than 3 percent per year over the years, except for the last period, 1998-2000, when it contracted by -0.3 percent per year.

Major economic policy shifts occurred during the Aquino government. Structural reforms, which include trade liberalization, foreign exchange liberalization, investment reforms, banking reforms and privatization, were implemented. These reforms were intensified in the 1990s and are still being pursued at present.

One of the major results of these reforms is the increase in the share of foreign trade in the Philippine economy. From 13.6 percent export-to-GDP ratio in the 1967-1972 period, the share increased to 45.8 percent in 1998-2000 (Table 1). Import-to-GDP ratio likewise increased from 17.4 percent to 43.2 percent over the same period. The rise in the trade sector is mainly attributed to the recent surge in the demand for semiconductor in the world market. To date, almost 60 percent of the country's export consists of the highly raw-material import-dependent semiconductor.

Table 1. The Philippine Economy

	GDP Growth	Employment Growth	Export/ GDP	Import/ GDP
1967-72	4.8%	3.3%	13.6%	17.4%
1973-82	5.5%	3.1%	16.0%	22.8%
1983-85	-4.1%	3.2%	15.4%	20.4%
1986-90	4.5%	2.1%	17.4%	23.0%
1991-93	-0.1%	3.7%	19.5%	30.2%
1994-97	4.9%	3.3%	24.5%	39.3%
1998-2000	3.5%	-0.3%	45.8%	43.2%

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

Growth Performance and Basic Structure

In spite of the reforms and the dramatic rise in foreign trade, there are obvious signs of structural weaknesses in the local economy. These are evident in the stagnating shares of the industry and manufacturing sectors over the past 35 years (Table 2). The share of industry picked up from 31.7 percent in 1967-1972 to 37.4 percent in 1983-1985. Then it began to drop and continued to do so through 1998-2000 leaving a 30.9 percent share. A similar dismal record for the manufacturing sector is observed over the same period. The agriculture and service sectors, however, exhibited opposing trends: while the share of agriculture steadily dropped from 1967-1972 through 1998-2000, the share of the service sector continued to rise.

The disappointing and stagnating share of the industry and manufacturing sectors is also observed in the structure of employment. Employment share in industry is about 15 percent, while its share in manufacturing is 10 percent (Table

Table 2. Production Structure

	Gross value added shares			
	Agriculture	Industry	Manufacturing	Services
1967-72	29.3%	31.7%	24.7%	39.0%
1973-82	27.9%	36.8%	25.6%	35.3%
1983-85	23.9%	37.4%	24.7%	38.7%
1986-90	23.1%	34.7%	25.0%	42.2%
1991-93	21.5%	33.2%	24.4%	45.4%
1994-97	20.7%	32.2%	22.8%	47.0%
1998-2000	17.2%	30.9%	21.9%	52.0%

Sources: National Income Accounts, Philippine Statistical Yearbook.

Table 3. Employment Structure

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

Sources: Philippine Statistical Yearbook.

3). These shares have practically stagnated as compared to the rising employment share in the service sector.

The contrasting performance of the foreign trade and industrial sectors, in general, and the manufacturing subsector, in particular, in terms of output and employment generation amid the policy reforms, indicate the absence of any trickle down effects. Considering that these policy reforms have been pursued for quite sometime, the lack of concrete trickle down effects would strongly imply a high degree of duality existing between the local and foreign sectors.

Table 4 shows a detailed structure of production of the economy based on the official 1990 Social Accounting Matrix (SAM). The agriculture and service sectors have high value added content as compared to the industry sector. Electrical equipment manufacturing, whose major operation is the production of semiconductor, has a value added ratio of 15 percent.

About 78 percent of the overall value added is payment to capital. Payment to labor accounts for only 12.4 percent, while the rest is payment to variable capital, which is officially called mixed income. Across sectors, however, the composition varies widely. It is important to note especially in income distribution analysis that payment to variable capital in agriculture captures more than 30 percent of the value added. In fact, in palay and corn production, payment to variable capital is almost 83 percent. In livestock and poultry, it is 56.2 percent, while in fruits and vegetable it is 45.8 percent. In contrast, in industry, the share of payment to capital is below 10 percent, except for garment and leather (13.7 percent) and fish manufacturing (10.2 percent). In the service sector, the only subsector with huge payment to variable capital is private health.

Table 4. Production and Factors (1990 Social Accounting Matrix)

	Output		Value Added		Factor Shares in Value Added			Sectoral Factor Shares		
	Value (Pb)	Share (%)	VA/XD (%)	Share (%)	Labor (%)	Variable capital* (%)	Capital (%)	Labor (%)	Variable capital* (%)	Capital (%)
Palay and Corn	66.9	3.3	77.9	5.3	4.5	82.8	12.7	0.95	13.13	0.22
Fruits and Vegetables	59.1	2.9	80.6	4.8	10.9	45.8	43.3	3.03	9.64	1.00
Coconut & Sugar	20.3	1.0	88.3	1.8	8.0	4.6	87.4	2.42	1.04	2.17
Livestock & Poultry	70.7	3.5	63.7	4.6	9.7	56.2	34.2	2.25	9.86	0.66
Fishing	50.5	2.5	79.8	4.1	4.1	23.6	72.3	1.69	7.34	2.46
Other Agriculture	25.9	1.3	71.8	1.9	9.6	7.9	82.4	2.48	1.54	1.76
Forestry	12.8	0.6	67.6	0.9	2.9	1.2	95.9	0.66	0.20	1.80
AGRICULTURE	306.4	15.1	75.2	23.3	7.1	31.7	61.2	13.46	42.76	10.07
Mining	24.3	1.2	65.9	1.6	7.1	1.2	91.7	2.33	0.30	2.48
Rice & Corn Milling	89.2	4.4	25.4	2.3	1.8	4.1	94.2	0.93	1.63	4.14
Milled Sugar	22.9	1.1	33.9	0.8	2.7	0.0	97.3	0.60		1.79
Meat Manufacturing	88.6	4.4	24.9	2.2	3.2	2.8	94.0	1.65	1.08	3.98
Fish Manufacturing	15.9	0.8	40.7	0.7	3.4	10.2	86.4	0.35	0.80	0.74
Beverage & Tobacco	26.8	1.3	57.3	1.5	2.4	0.7	96.9	1.04	0.22	3.43
Other Food Manufacturing	105.2	5.2	37.7	4.0	2.9	2.8	94.4	2.69	1.96	7.35
Textile manufacturing	35.0	1.7	16.3	0.6	13.5	6.4	80.1	0.99	0.35	0.48
Garments & Leather	52.8	2.6	26.8	1.4	10.0	13.7	76.2	1.62	1.67	1.02
Wood Manufacturing	25.8	1.3	36.3	0.9	5.5	7.4	87.1	0.85	0.87	1.11
Paper & Paper Products	19.4	1.0	25.4	0.5	6.1	3.6	90.3	0.57	0.25	0.70
Chemical Manufacturing	55.1	2.7	27.4	1.5	3.5	1.1	55.4	1.33	0.32	3.01
Petroleum Refining	61.8	3.0	22.0	1.4	0.9	0.0	99.1	0.39		3.69
Non-metal manufacturing	39.9	2.0	21.9	0.9	6.1	4.9	88.9	0.96	0.58	1.15
Metal Manufacturing	49.4	2.4	16.1	0.8	6.7	3.6	89.7	0.99	0.41	1.09
Electrical Equipment Manufacturing	46.7	2.3	15.1	0.7	11.0	0.0	89.0	1.40		0.94
Transport & Other Machinery Manufacturing	35.0	1.7	12.0	0.4	10.1	0.0	89.9	0.79		0.58
Other Manufacturing	42.1	2.1	10.4	0.4	3.1	4.5	92.4	0.29	0.32	0.71
Construction	140.7	6.9	45.6	6.5	12.8	2.6	84.7	12.29	1.86	6.75
Electricity, Gas and Water	44.1	2.2	49.7	2.2	2.9	0.0	97.1	1.79		4.99
INDUSTRY	1020.6	50.3	30.5	31.5	5.8	3.5	90.7	33.85	12.61	50.14
Financial Sector	50.4	2.5	71.1	3.6	5.4	0.3	94.3	4.56	0.17	6.61
Private Education	16.6	0.8	60.7	1.0	24.3	8.2	67.5	2.23	0.57	0.51
Private Health	18.8	0.9	49.9	0.9	11.6	28.2	60.2	0.85	1.56	0.36
Public Education	28.1	1.4	85.5	2.4	79.1	0.0	20.9	8.37		0.18
Public Health	7.6	0.4	55.5	0.4	66.2	0.0	33.8	1.44		0.06
General Government	73.7	3.6	66.1	4.9	70.7	0.0	29.3	16.72		0.57
Other Services	507.8	25.0	62.1	31.9	4.1	12.3	83.6	18.51	42.33	31.48
SERVICES	703.1	34.6	63.7	45.3	37.3	7.0	55.7	52.69	44.63	39.79
TOTAL	2030.1	100.0	48.7	100.0	12.4	10.0	77.6	100.00	100.00	100.00

Growth Performance and Basic Structure

Source: 1990 Social Accounting Matrix (NSCB).

VA : Value added

XD Total Output

* from mixed income

II



Trade Reforms

A number of trade reform programs were implemented before the 1990s, but the major one was started in the early 1980s. The program had three major components: the 1981-1985 Tariff Reform Program (TRP), the Import Liberalization Program (ILP), and the complimentary realignment of the indirect taxes. In the TRP, there was a narrowing of the tariff rate structure from 100-0 percent to 50-10 percent. During the period 1983-1985, sales taxes on imports and locally produced goods were equalized. Also, the markup applied on the value of imports (for sales tax valuation) was reduced and eventually eliminated.

However, because of the balance-of-payments crisis during the mid-1980s, the import liberalization program was suspended. Some of the items that were deregulated earlier were re-regulated.

The trade reform program of the early 1980s was resumed when the Aquino administration took over in 1986. This resulted in the reduction of the number of regulated items from 1,802 in 1985 to 609 in 1988. Furthermore, export taxes on all products except logs were abolished.

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

10 percent of the total number of commodity lines were still subjected to 0-5 percent tariff and 50 percent tariff rates by the end of the program in 1995.

“Tariffication” of quantitative restrictions (QRs), that is, converting them into tariff equivalent, started in 1992 with the implementation of EO 8. There were 153 commodities whose QRs were converted into tariff equivalent rates. Also, under the same EO, tariff rates on 48 commodities were further realigned. EO 8 raised the tariff rates applicable to the relevant commodities by 100 percent of their pre-EO 8 levels. In effect, the tariff rates imposed were higher than the tariff equivalent rates in a number of cases, especially during the initial years of the conversion. However, EO 8 has a built-in program for a five-year phase-down of the “tariffied” rates.

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

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

Another major tariff program is the uniform tariff rate, which is scheduled to be implemented beginning 2004. The current debate concerns the rate at which the tariff rate will be set uniformly across industries. A 5-percent uniform tariff rate is being contemplated.

Table 5 presents industry-weighted averages of nominal and implicit tariff rates. Implicit tariff rates were computed using local and border prices. Overall, as a result of the trade reform program, tariff protection has been significantly reduced. The decline is pronounced in the industry and agriculture sectors. To date, however, palay and corn production, as well as rice and corn milling, enjoy high tariff

Table 5. Trade Protection

Sectors	Nominal Tariff Rate				Implicit Tariff Rate		
	SAM ¹	1990	1995	2000	1990	1995	2000
Palay and Corn	0.25	0.41	0.41	0.43	0.56	0.66	0.43
Fruits and Vegetables	0.37	0.41	0.40	0.12	0.21	0.20	0.06
Coconut & Sugar	3.06	0.20	0.37	0.11	0.00	0.00	0.00
Livestock & Poultry	0.66	0.03	0.02	0.01	0.05	0.03	0.02
Fishing	0.20	0.30	0.25	0.08	0.17	0.14	0.06
Other Agriculture	0.05	0.13	0.11	0.11	0.11	0.09	0.14
Forestry	0.08	0.18	0.11	0.03	0.18	0.11	0.03
AGRICULTURE	0.16	0.20	0.18	0.14	0.18	0.17	0.15
Mining	0.01	0.11	0.22	0.03	0.14	0.08	0.03
Rice & Corn Milling	0.04	0.40	0.40	0.44	0.39	0.50	0.44
Milled Sugar	3.70	0.50	0.50	0.63	0.44	0.39	0.23
Meat Manufacturing	0.46	0.44	0.30	0.18	0.11	0.09	0.06
Fish Manufacturing	0.74	0.48	0.30	0.15	0.17	0.11	0.06
Beverage & Tobacco	1.45	0.49	0.46	0.11	0.38	0.38	0.14
Other Food Manufacturing	0.19	0.35	0.31	0.13	0.24	0.18	0.10
Textile manufacturing	0.16	0.42	0.19	0.10	0.25	0.12	0.06
Garments & Leather	0.26	0.49	0.29	0.18	0.27	0.16	0.10
Wood Manufacturing	0.64	0.45	0.26	0.13	0.18	0.14	0.09
Paper & Paper Products	0.09	0.33	0.19	0.08	0.27	0.17	0.11
Chemical Manufacturing	0.06	0.23	0.12	0.06	0.30	0.18	0.10
Petroleum Refining	0.87	0.11	0.13	0.03	0.11	0.11	0.02
Non-metal manufacturing	0.15	0.19	0.10	0.06	0.28	0.19	0.08
Metal Manufacturing	0.05	0.26	0.17	0.08	0.27	0.22	0.13
Electrical Equipment Manufacturing	0.05	0.27	0.10	0.04	0.23	0.10	0.23
Transport & Other Machinery Manufacturing	0.06	0.24	0.16	0.10	0.25	0.15	0.09
Other Manufacturing	0.08	0.35	0.19	0.07	0.18	0.09	0.05
Construction							
Electricity, Gas and Water							
INDUSTRY	0.10	0.26	0.18	0.08	0.24	0.15	0.11
Financial Sector							
Private Education							
Private Health							
Public Education							
Public Health							
General Government							
Other Services							
SERVICES	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	0.10	0.26	0.18	0.08	0.23	0.15	0.11

¹Calibrated tariff rate.

Source: 1990 Social Accounting Matrix (NSCB) and Manasan and Querubin (1997).

protection. Under the World Trade Organization (WTO) agreement, quantitative restriction on rice is still allowed.

Increasing implicit tariff rates were seen in some sectors during the early 1990s. This was largely due to the effects of the "tariffication" of quantitative restrictions. However, from the mid-1990s to the turn of the century, all of the sectors exhibited a declining trend. Food manufacturing had the highest implicit tariff, while mining had the lowest.

Manasan and Querubin (1997)¹ analyzed the impact of the different trade and tariff reform programs in the 1990s on the structure of tariff. In particular, they computed the implicit tariff rates and effective rates of protection (EPRs) for 169 commodities based on domestic and border prices. They found that as a result of the series of reforms, significant achievements were attained in the area of tariff simplification. Over time, the program restructured the tariff system from a 5-level to a 3-level rate schedule. Moreover, most of the commodities cluster around the 3-20 percent range.

Furthermore, based on the results, they observed gains in the form of reduction in the average nominal and implicit tariff rates, as well as in the EPRs over the period 1990-2000. Overall, the average nominal tariff rate decreased from 33.3 percent in 1990 to 19.5 percent in 2000. Likewise, the average implicit rate based on price comparison declined from 28.6 percent in 1990 to 16.8 percent in 2000. In addition, the overall EPR based on price comparison dropped from 29.4 percent in 1990 to 18.0 in 2000.

It was also observed that the decline in the EPRs is pronounced in the manufacturing group than in the primary group, particularly in the agriculture subgroup. This implies a switchover in relative protection in the agriculture and manufacturing sectors. Relative protection is observed to increase from 1995 to 2000, in sharp contrast to the previous decades when the agriculture sector was penalized heavily relative to the manufacturing sector. During the period 1990-1994, the manufacturing group enjoyed relatively higher protection than the agriculture sector. There was a major switch during the period 1995-2000 in favor of agriculture.

¹ Manasan, R.G. and R.G. Querubin. 1997. Assessment of Tariff Reform in the 1990s. PIDS Discussion Paper Series No. 97-10.

Trade Reforms, Income Distribution and Welfare

What are the effects of these trade reforms on the structure of the foreign trade sector? Table 6a shows the structure of exports and Table 6b shows the structure of imports. Table 6c presents the structure of both in 1990 according to the Social Accounting Matrix (SAM) industry breakdown. Manufactured exports increased its share to the total from almost 70 percent in 1990 to 91.2 percent in 2000. The increase is mainly due to the surge in exports of electrical equipment, mostly semiconductor, which captures almost 60 percent of the country's export. On the other hand, the share of importation

Table 6a. Exports (million US dollars)

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

Source: Selected Philippine Economic Indicators, Bangko Sentral ng Pilipinas.

Table 6b. Imports (million US dollars)

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

Source: Selected Philippine Economic Indicators, Bangko Sentral ng Pilipinas.

Trade Reforms

Table 6c. Import and Export Shares (1990 Social Accounting Matrix)

	Shares (%)	
	Imports	Exports
Palay and Corn	0.42	0.01
Fruits and Vegetables	0.43	1.66
Coconut & Sugar	0.05	0.14
Livestock & Poultry	0.25	0.21
Fishing	0.30	2.16
Other Agriculture	1.85	0.91
Forestry	0.23	0.16
AGRICULTURE	3.53	5.25
Mining	8.91	2.21
Rice & Corn Milling	0.92	0.06
Milled Sugar	0.06	1.05
Meat Manufacturing	0.21	0.01
Fish Manufacturing	0.05	0.71
Beverage & Tobacco	0.93	0.40
Other Food Manufacturing	3.26	2.41
Textile manufacturing	4.04	2.47
Garments & Leather	3.46	12.75
Wood Manufacturing	0.18	1.88
Paper & Paper Products	1.31	1.51
Chemical Manufacturing	7.55	1.85
Petroleum Refining	2.18	1.88
Non-metal manufacturing	1.59	1.02
Metal Manufacturing	8.16	2.72
Electrical Equipment Manufacturing	9.46	11.75
Transport & Other Machinery Manufacturing	9.84	1.16
Other Manufacturing	4.01	9.12
Construction	0.05	0.07
Electricity, Gas and Water	0.00	0.64
INDUSTRY	66.19	55.67
Financial Sector	2.58	1.01
Private Education	0.00	0.00
Private Health	0.09	0.15
Public Education	0.00	0.00
Public Health	0.00	0.00
General Government	0.00	0.00
Other Services	27.61	37.92
SERVICES	30.28	39.08
TOTAL	100.00	100.00
Total Value (Pb)	358.58	297.98
Current Account Balance (P billion)		-51.71

Source: 1990 Social Accounting Matrix, National Statistical Coordination Board.

Trade Reforms, Income Distribution and Welfare

of capital goods increased from 25.6 percent 1990 to 40 percent in 2000.

Tariff revenue is a major source of funds of government revenue (Tables 7a and 7b). In 1990, the share of revenue derived from import duties and taxes was 26.4 percent, about 4 percent of the gross national product (GNP). This share increased to 27.7 percent in 1995, or about 5 percent of the GNP. However, because of the tariff reforms, the share dropped to 19.3 percent in 2000, or about 2.7 percent of the GNP.

These results just show that the price of tariff reform is huge in terms of government revenue. The cost is indeed substantial and therefore poses a major policy challenge, especially in a situation wherein the overall government deficit

Table 7a. National Government Balances

	SAM	1990	1995	2000
Tax Revenue	73.2	83.9	85.7	89.1
Taxes on net Income and Profits	34.3	27.3	30.7	38.6
Excise and Sales Taxes	27.6	27.2	23.4	28.1
Import Duties and other Import Taxes	11.3	26.4	27.7	19.3
Other Taxes		3.0	3.9	3.1
Non-Tax Revenue	26.8	14.8	14.0	10.6
Grants		1.3	0.3	0.3
Total	100.0	100.0	100.0	100.0
Total Revenue (Pb)	225.7	180.9	362.2	507.1
Total Expenditure (Pb)	233.3	218.1	350.1	641.8
(Deficit)/Surplus (Pb)	(7.6)	(37.2)	12.1	(134.7)

Source: 1990 SAM, Selected Philippine Economic Indicators (BSP).

Table 7b. National Government Balances

Percent of Gross National Product

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
REVENUES	16.9%	17.6%	17.7%	17.3%	19.4%	18.4%	18.2%	18.7%	16.4%	15.3%	14.5%
Tax Revenues	14.2%	14.5%	15.2%	15.2%	15.6%	15.9%	16.3%	16.3%	14.8%	13.8%	12.9%
Bureau of Internal Revenue	9.7%	9.3%	9.7%	9.7%	10.8%	10.7%	11.5%	12.4%	12.0%	10.9%	10.1%
Bureau of Customs	4.3%	5.1%	5.3%	5.4%	4.7%	5.0%	4.6%	3.7%	2.7%	2.8%	2.7%
Other Offices	0.2%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Non-Tax Revenues	2.5%	2.8%	2.3%	1.9%	3.7%	2.6%	1.9%	2.4%	1.6%	1.5%	1.5%
Grants	0.2%	0.2%	0.2%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
EXPENDITURES	20.4%	19.7%	18.8%	18.7%	18.4%	17.9%	17.9%	18.6%	18.2%	18.8%	18.4%
DEFICIT	-3.5%	-2.1%	-1.2%	-1.5%	0.9%	0.6%	0.3%	0.1%	-1.8%	-3.6%	-3.9%

Sources: Bangko Sentral ng Pilipinas; COR(FPAD-RS) Bureau of Treasury; Statistical Data Analysis Division - Research Service.

Trade Reforms

Table 8. Average Tax Rates (1990 Calibrated SAM values)

	Tariff Rates	Indirect Tax Rates
Palay and Corn	0.25	0.006
Fruits and Vegetables	0.37	0.010
Coconut & Sugar	3.06	0.009
Livestock & Poultry	0.66	0.007
Fishing	0.20	0.005
Other Agriculture	0.05	0.018
Forestry	0.08	0.007
AGRICULTURE	0.15	0.008
Mining	0.01	0.027
Rice & Corn Milling	0.04	0.002
Milled Sugar	3.70	0.012
Meat Manufacturing	0.46	0.004
Fish Manufacturing	0.74	0.008
Beverage & Tobacco	1.45	0.097
Other Food Manufacturing	0.19	0.026
Textile manufacturing	0.16	0.093
Garments & Leather	0.26	0.215
Wood Manufacturing	0.64	0.017
Paper & Paper Products	0.09	0.035
Chemical Manufacturing	0.06	0.038
Petroleum Refining	0.87	0.082
Non-metal manufacturing	0.15	0.027
Metal Manufacturing	0.05	0.049
Electrical Equipment Manufacturing	0.05	0.195
Transport & Other Machinery Manufacturing	0.06	0.086
Other Manufacturing	0.08	0.093
Construction		0.006
Electricity, Gas and Water		0.010
INDUSTRY	0.11	0.000
Financial Sector		0.056
Private Education		0.010
Private Health		0.019
Public Education		0.000
Public Health		0.000
General Government		0.000
Other Services		0.068
SERVICES	0.00	0.051
TOTAL	0.11	0.036

Source: 1990 Social Accounting Matrix (NSCB).

is not only huge but is also ballooning. From surpluses in the middle of the 1990s, government balances flipped to deficit starting 1998, and deteriorated since then to -3.9 percent of GNP in 2000. The culprit was the tax revenue generation because while the expenditure ratio was within the 18 percent ratio to GNP, the tax ratio dropped from 16.3 percent in 1996 to 12.9 percent in 2000. This shows that the viability of any tariff reform program depends significantly on how revenue generation from local taxes can improve to offset whatever tariff revenue losses the government may incur.

III



Income Sources, Distribution and Poverty

Table 9 shows the sources of income of households, as captured in the 1990 SAM. There are important differences across decile categories of households that have to be highlighted. Of its total income, the first decile sources 12.7 percent from agriculture labor income and the second decile sources 13.1 percent. The share declines as one moves up to the higher deciles. For the tenth decile, agriculture labor income is only 0.7 percent of its total income.

The opposite trend is observed in nonagriculture labor income. The first decile sources 6.7 percent of its income from this source, while the ninth and tenth deciles source 39.9 percent and 32.8 percent, respectively. Mixed income from agriculture is a major source of income of the first decile, capturing 47.1 percent of the total. It decreases significantly as one moves up to the higher decile groups. The tenth decile sources only 6.3 percent from agriculture mixed income. However, for mixed income in nonagriculture, it is the opposite. The tenth decile sources 32.8 percent of its income from this source, while the first decile sources only 10.2 percent.

Table 10 presents the structure of household consumption. On the whole, household consumption is 13.65 percent agriculture-based, while 48.94 percent is industry-based. Household consumption is 37.41 percent service sector-based.

Interestingly, poverty incidence dropped from 44.2 percent in 1985 to 35.5 percent in 1994 to 31.8 percent in 1997 (Table 11). However, the latest poverty information in 2000 indicates that this declining trend is reversing, with the incidence inching up to 34.2 percent.

Table 9. Sources of Income in 1990

	Average Income (Pbillion)	Labor Income		Mixed Income		Other Income ¹	Foreign Transfers	Total
		Agriculture	Non-agriculture	Agriculture	Non-agriculture			
Decile 1	18.2	12.7%	6.2%	47.1%	10.2%	22.0%	1.8%	100.0%
Decile 2	30.5	13.1%	9.3%	43.1%	11.0%	21.5%	2.1%	100.0%
Decile 3	38.7	11.9%	13.1%	39.2%	12.5%	21.6%	1.7%	100.0%
Decile 4	47.8	10.8%	16.2%	37.5%	13.6%	19.9%	2.0%	100.0%
Decile 5	56.5	8.1%	21.5%	33.1%	15.3%	20.2%	1.7%	100.0%
Decile 6	69.2	6.9%	27.2%	26.7%	18.4%	18.4%	2.3%	100.0%
Decile 7	83.3	4.6%	34.7%	20.3%	18.1%	20.9%	1.4%	100.0%
Decile 8	106.2	3.4%	37.6%	13.9%	19.4%	22.1%	3.6%	100.0%
Decile 9	145.8	1.7%	39.9%	9.8%	22.6%	25.6%	0.4%	100.0%
Decile 10	331.0	0.7%	32.8%	6.3%	32.0%	28.2%	0.0%	100.0%

Source: 1990 Social Accounting Matrix, National Statistical Coordination Board.

¹Include dividend incomes from unincorporated and private corporations, income from government securities, and government transfers.

Table 10. Household Consumption (1990 Social Accounting Matrix)

	Household Consumption Shares (%)										Total	
	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	Total	Value (Pb)
Palay and Corn	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.05	0.4
Fruits and Vegetables	7.07	6.87	6.51	6.45	6.32	6.08	5.90	5.64	5.34	4.52	5.51	42.2
Coconut & Sugar	0.20	0.19	0.18	0.18	0.18	0.17	0.17	0.16	0.15	0.13	0.16	1.2
Livestock & Poultry	2.18	2.12	2.03	2.02	1.98	1.92	1.88	1.82	1.75	1.57	1.80	13.7
Fishing	6.29	6.11	5.79	5.74	5.62	5.40	5.25	5.01	4.75	4.02	4.90	37.5
Other Agriculture	0.98	0.96	0.90	0.90	0.88	0.84	0.82	0.78	0.74	0.63	0.77	5.9
Forestry	0.55	0.52	0.49	0.48	0.47	0.47	0.47	0.48	0.48	0.44	0.47	3.6
AGRICULTURE	17.34	16.84	15.97	15.83	15.51	14.94	14.53	13.93	13.27	11.34	13.65	104.5
Mining	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.16	0.17	0.20	0.17	1.3
Rice & Corn Milling	12.45	12.10	11.47	11.37	11.14	10.71	10.40	9.94	9.43	8.00	9.73	74.4
Milled Sugar	1.38	1.35	1.28	1.26	1.24	1.19	1.16	1.10	1.05	0.89	1.08	8.3
Meat Manufacturing	12.80	12.44	11.78	11.68	11.44	11.00	10.68	10.20	9.67	8.17	9.98	76.3
Fish Manufacturing	2.05	2.00	1.89	1.88	1.84	1.77	1.72	1.64	1.56	1.32	1.61	12.3
Beverage & Tobacco	3.18	3.59	3.73	3.83	3.90	3.85	3.76	3.59	3.27	2.50	3.26	25.0
Other Food Manufacturing	12.69	12.55	12.08	12.04	11.86	11.51	11.22	10.78	10.25	8.75	10.48	80.2
Textile manufacturing	0.27	0.30	0.33	0.34	0.34	0.35	0.36	0.36	0.36	0.37	0.35	2.7
Garments & Leather	2.20	2.56	2.73	2.84	2.88	2.91	2.96	2.94	2.89	2.75	2.82	21.6
Wood Manufacturing	0.62	0.62	0.74	0.71	0.74	0.82	0.87	0.98	1.11	1.41	1.05	8.0
Paper & Paper Products	0.28	0.29	0.34	0.35	0.36	0.39	0.41	0.44	0.47	0.51	0.44	3.3
Chemical Manufacturing	0.95	0.99	1.09	1.11	1.13	1.20	1.25	1.31	1.39	1.51	1.32	10.1
Petroleum Refining	0.28	0.27	0.25	0.25	0.25	0.25	0.25	0.25	0.26	0.24	0.25	1.9
Non-metal manufacturing	0.74	0.75	0.91	0.88	0.92	1.03	1.09	1.23	1.40	1.80	1.32	10.1
Metal Manufacturing	0.19	0.19	0.22	0.22	0.22	0.25	0.26	0.29	0.32	0.41	0.31	2.3
Electrical Equipment Manufacturing	1.00	1.01	1.23	1.18	1.23	1.38	1.47	1.66	1.88	2.43	1.78	13.6
Transport & Other Machinery Manufacturing	0.21	0.22	0.24	0.25	0.28	0.30	0.33	0.37	0.42	0.62	0.42	3.2
Other Manufacturing	0.69	0.75	0.84	0.87	0.89	0.94	0.98	1.02	1.07	1.14	1.01	7.7
Construction	0.15	0.16	0.19	0.18	0.19	0.21	0.23	0.25	0.29	0.37	0.27	2.1
Electricity, Gas and Water	1.52	1.43	1.36	1.34	1.30	1.30	1.29	1.32	1.34	1.24	1.30	10.0
INDUSTRY	53.77	53.70	52.82	52.71	52.29	51.52	50.85	49.84	48.59	44.62	48.94	374.5
Financial Sector	0.47	0.52	0.60	0.63	0.65	0.70	0.74	0.79	0.84	1.22	0.88	6.7
Private Education	1.31	1.45	1.67	1.75	1.80	1.96	2.06	2.19	2.35	2.52	2.16	16.6
Private Health	1.31	1.44	1.65	1.73	1.78	1.94	2.04	2.17	2.33	2.54	2.16	16.5
Public Education	0.03	0.03	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.06	0.05	0.4
Public Health	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.04	0.3
General Government	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Other Services	25.76	25.98	27.21	27.28	27.90	28.86	29.69	30.99	32.52	37.65	32.12	245.8
SERVICES	28.89	29.46	31.21	31.47	32.20	33.53	34.62	36.22	38.15	44.04	37.41	286.2
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	765.2

Source: 1990 Social Accounting Matrix, National Statistical Coordination Board.

Table 11. Distribution and Poverty

	1985	1991	1994	1997	2000
Gini Ratio	0.446	0.468	0.451	0.487	0.451
Poverty Incidence					
Philippines	44.2		35.5	31.8	34.2
NCR	23.0		8.0	6.4	9.7
Outside NCR	47.5		39.9	35.9	38.3
CAR			51.0	42.5	36.9

Source: National Statistical Coordination Board and National Statistics Office.

Note: NCR is National Capital Region, and CAR is Cordillera Autonomous Region.

There are huge discrepancies in poverty incidence across regions, with the National Capital Region (NCR) where Metro Manila is located having the lowest poverty incidence. There was a significant drop in poverty incidence in the NCR from 23.0 percent in 1985 to 8.0 percent in 1994 and further down to 6.4 percent in 1997. The trend reversed in 2000 as poverty increased to 9.7 percent.

Although poverty incidence in areas outside the NCR also dropped over the same period, such reduction was considerably less than in the NCR. In 1997, poverty incidence in these areas was still very high at 35.9 percent and it further increased to 38.3 percent in 2000. In poorer regions like the Cordillera Administrative Region (CAR), poverty incidence in 1997 was still above 40 percent, although it slightly dropped in 2000. Based on these indicators, two points are worth noting: (1) there is an apparent substantial gap in poverty incidence between urban and rural areas, and (2) such gap is deteriorating over time.

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

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

Since 1961, except from 1988 to 1991, the Gini ratio exhibited a slow but steady decline. However, from 1994 to 1997, the Gini ratio worsened significantly, from 0.451 to 0.487, with the latter being the highest registered figure in the three and a half decades. In 1985, the average income of a family belonging to the wealthiest decile was 18 times the income of a family belonging to the poorest decile. In 1997, this went up to 24. In terms of spatial income disparity, the same trend was observed, as the ratio of the average family income in the poorest region likewise increased from 3.2 in 1995 to 3.6 in 1997. In 2000, the Gini coefficient slid down to 0.451.

IV



Model Description

A computable general equilibrium (CGE) model, calibrated to Philippine data using the official 1990 SAM, was employed to analyze the effects of trade reforms on income distribution and welfare. The model is called PCGEM, whose complete set of equations is presented in the Appendix.

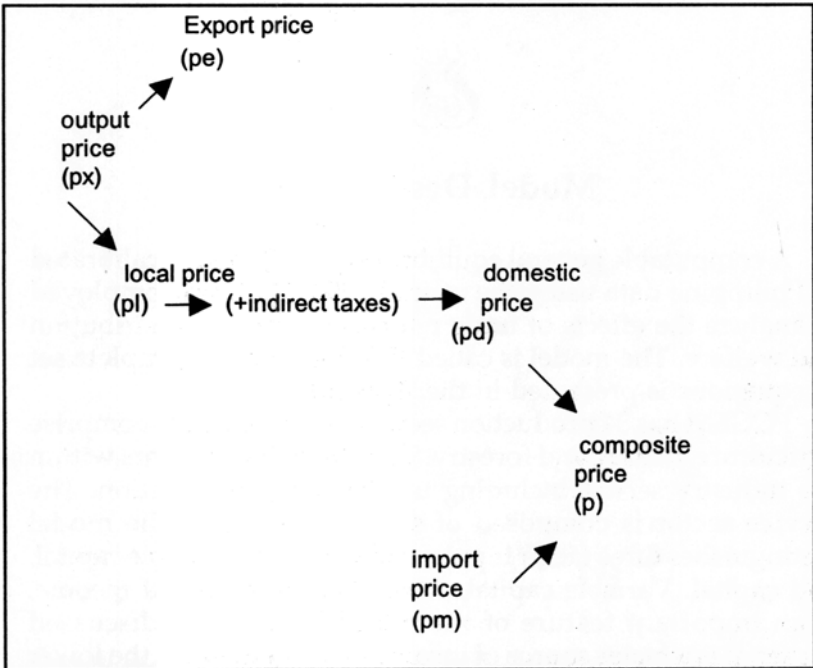
PCGEM has 34 production sectors, seven of which comprise agriculture, fishing and forestry. There are 20 subsectors within the industry sector, including utilities and construction. The service sector is composed of seven subsectors. The model distinguishes three factor inputs, namely, labor, variable capital, and capital. Variable capital, which generates mixed income, is an important feature of the model because, as discussed earlier, it is a major source of income of households in the lower decile groups. It is a major factor in agriculture, particularly in major crops such as palay and corn that are critical to the lower income groups. Variable capital is likewise a major factor in livestock and poultry and fruits and vegetables. Labor is assumed mobile across sectors. For lack of formal modeling of the variable capital, it is also assumed to be mobile across sectors. Capital, however, is fixed in each of the industries.

Except for capital, there are no restrictions on quantities and prices. Prices vary to clear all the markets. Households are grouped in decile.

The simulations conducted in the paper involve changing the tariff rates of the industries. Compensatory taxes such as changes in indirect taxes and income taxes were also included in the simulations. Refer to Figure 1 for the basic price relationships in the model.

Output price, p_x , affects export price, p_e and local prices, p_l . Indirect taxes are added to the local price to determine domestic prices, p_d , which together with import price, p_m ,

Figure 1. Basic Price Relationships in PCGEMX



where $pm = p_{wm} \cdot er \cdot (1+tm) \cdot (1+itx)$; p_{wm} is world price of imports; er is exchange rate; tm is tariff rate; and itx is indirect tax.

will determine the composite price, p . 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 . Therefore, the direct effect of tariff reduction is a reduction in pm . If the reduction in pm is significant enough, the composite price, p , will also decline.

The value added relation as well as the underlying utility function of consumers is assumed Cobb-Douglas. Armington-CES (constant elasticity substitution) function is assumed between local and imported goods, while a CET (constant elasticity of transformation) is imposed between exports and local sales. The Armington and the CET elasticities are presented in Table 15.

In terms of model closure, the current account balance, as well as the exchange rate, is fixed. Total investment in real

terms and total government consumption, also in real terms, are both held fixed. Total investment and total government consumption in nominal terms vary. Their respective prices vary as well. Transfer within government, which captures the remittances of government corporations to the national government, is endogenous.

V



Simulation Results

Two scenarios were analyzed in the simulation exercises. The first involved complete elimination of tariff. The second involved actual change in tariff.

1. ZERO_YTAX - this is a scenario of complete elimination of tariff in all sectors, that is, t_m in Figure 1 in all sectors is set to zero. The compensatory tax mechanism is additional income tax, implemented in the model through the following equations:

$$\begin{aligned} 1a. \text{ dpyh} &= y_h \cdot (1 - \text{ydtax}_h \cdot (1 + \text{ntaxr})) \\ 1b. \text{ ntaxr} &= \text{ntax} / (\sum_h y_h) \\ 1c. \text{ yg}' &= \text{yg} + \text{ntax} \end{aligned}$$

where dpyh is disposable income of household h ; y_h is income; ydtax_h is direct income tax; ntaxr is additional income tax rate, and yg' is government income augmented by additional tax revenue ntax .

2. ACTUAL_YTAX - this is similar to the previous scenario except that sectoral tariffs were reduced using actual change in tariff within the period 1990-2000. That is, the calibrated tariff rates in the model were updated in the simulation run using the actual nominal tariff change calculated from the peak tariff rate to the lowest rate within the period. For example, in the case of palay and corn, the change in the nominal tariff rate from the peak in 1996 to the lowest rate in 2000 was calculated using a simple growth formula and applied to update the calibrated tariff rate in the model.

The compensatory tax mechanism is the same as the previous one.

Some of the base values of variables were presented in the tables discussed in the preceding sections. In Tables 12 to 14, other relevant base values of variables are presented. These values are important in the comparative analysis of the simulation results given below.

Results

Presented in Tables 15-20 are the results of the first scenario, ZERO_YDTAX.

Focus first on the overall effects of import price, pm . The total elimination of tariff rates resulted in a drop of import prices of -6.71 percent (Table 17). The percentage drop in pm of agriculture was higher than that of industry (-13.86 percent vs. -9.39 percent).

The effect on the composite price, p , was similar. As shown in Table 15, the overall composite price dropped by -1.32 percent. However, the composite prices of agriculture and industry moved in the opposite direction: while the composite price of agriculture increased by 0.69 percent, that of industry dropped by -7.65 percent.

As a result of tariff elimination, overall imports increased by 5.62 percent. The increase in agriculture imports was much higher at 32.19 percent, as compared to industry which had been only 6.42 percent (Table 15). There were huge variations, however, on the effects at the industry specific level.

Overall output, xd , increased by 0.89 percent, while total domestic sales declined by -0.13 percent (Table 15). Output of total agriculture and domestic sales declined by -0.77 percent and -0.66 percent, respectively.

The share of export to output increased under this scenario relative to the base. The overall export-output ratio in the base case was 14.73 percent (Table 12), while it was 15.58 percent in this scenario (Table 15). The increase was due to the improvement in the export ratio for agriculture and services. There was a decline for industry and within specific industries, wide variations were evident.

Meanwhile, the overall share of imports to the total composite goods slightly declined from 18.16 percent in the

Simulation Results

Table 12. Base Values of Some Relevant Variables

	Exports/Import Ratios (%)			Factory Intensities		
	$pe_1^*e/\Sigma pe_1^*e$	$pm_1^*m/p_1^*x_1$	$pe_1^*e/p_1^*x_1$	k/l	k/vk_1	vk/l_1
Palay and Corn	0.01	2.43	0.04	2.83	0.15	18.38
Fruits and Vegetables	1.66	3.06	8.38	3.99	0.94	4.22
Coconut & Sugar	0.14	0.93	2.13	10.86	19.08	0.57
Livestock & Poultry	0.21	1.41	0.89	3.54	0.61	5.82
Fishing	2.16	2.63	12.76	17.67	3.06	5.78
Other Agriculture	0.91	23.90	10.45	8.57	10.39	0.82
Forestry	0.16	6.99	3.80	33.04	81.02	0.41
AGRICULTURE	5.25	4.60	5.12			
Mining	2.21	66.60	27.19	12.87	76.58	0.17
Rice & Corn Milling	0.06	3.96	0.19	53.73	23.22	2.31
Milled Sugar	1.05	1.27	13.78	35.82		
Meat Manufacturing	0.01	0.93	0.02	29.12	33.65	0.87
Fish Manufacturing	0.71	1.48	13.33	25.41	8.48	3.00
Beverage & Tobacco	0.40	11.82	4.45	39.91	143.14	0.28
Other Food Manufacturing	2.41	11.52	6.86	33.11	34.14	0.97
Textile manufacturing	2.47	35.55	21.10	5.91	12.50	0.47
Garments & Leather	12.75	45.76	72.16	7.61	5.55	1.37
Wood Manufacturing	1.88	3.37	21.80	15.81	11.70	1.35
Paper & Paper Products	1.51	25.61	23.31	14.79	25.23	0.59
Chemical Manufacturing	1.85	37.33	10.02	27.33	85.28	0.32
Petroleum Refining	1.88	12.64	9.08	113.67		
Non-metal manufacturing	1.02	14.42	7.63	14.49	18.07	0.80
Metal Manufacturing	2.72	43.49	16.48	13.43	24.57	0.55
Electrical Equipment Mnfg.	11.75	75.66	75.13	8.12		
Transport & Other Mach.Mnfg.	1.16	54.56	9.89	8.93		
Other Manufacturing	9.12	50.90	64.82	29.94	20.52	1.46
Construction	0.07	0.14	0.16	6.64	33.02	0.20
Electricity, Gas and Water	0.64	0.01	4.36	33.81		
INDUSTRY	55.67	23.24	16.31			
Financial Sector	1.01	17.25	5.97	17.53	346.53	0.05
Private Education	0.00	0.03	0.06	2.78	8.23	0.34
Private Health	0.15	1.83	2.37	5.20	2.14	2.44
Public Education	0.00	0.00	0.00	0.26		
Public Health	0.00	0.00	0.00	0.51		
General Government	0.00	0.00	0.00	0.42		
Other Services	37.92	20.99	22.32	20.57	6.78	3.03
SERVICES	39.08	16.56	16.62			
TOTAL	100.00	18.37	14.73			

pe: price exports, pm: price of import, e: exports, m: imports, k: capital, vk: variable capital, l: labor.

scenario (Table 15) to 18.37 percent (Table 12) in the base. For agriculture, however, it was the opposite: the share of imports in the present scenario increased to 5.15 percent as compared to 4.60 percent in the base scenario. While a similar trend was observed for the service sector, the import ratio for industry followed the overall import share for the whole economy.

Table 13. Base Values of Household Income Shares

Income from:	Household Income Shares (%)										
	Total	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Labor	34.6	18.9	22.3	25.0	27.0	29.6	34.1	39.3	41.0	41.6	33.5
Variable Capital	40.0	57.3	54.0	51.7	51.1	48.4	45.1	38.4	33.3	32.4	38.3
Capital	19.1	20.2	20.1	20.0	18.8	18.8	16.4	16.8	16.9	18.4	21.0
Others	6.3	3.6	3.5	3.2	3.1	3.2	4.4	5.6	8.7	7.7	7.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 14. Base Values of Some Relevant Macro Variables

	Value (Pb)
Government Income:	225.69
Tariff Revenue	25.53
Indirect Tax Revenue	62.34
Direct Tax Revenue	77.30
Additional Tax Revenue	-
Total Nominal Government Consumption	10.88
Total Real Government Consumption	10.88
Price Index of Total Government Consumption	1.00
Government Balance	(7.56)
Total Nominal Investment	2,601.63
Total Real Investment	2,601.63
Price Index of Total Investment	1.00
Balance of Trade	(59.65)
Current Account Balance	51.71

Table 15. Trade Effects (scenario: zero tariff and compensatory income taxes)

	Elasticities		Tariff Rate		Sectoral Shares				
	armington	CET	tm0	Δtm (%)	$pva^*va/\Sigma pva^*va$ (%)	$pm^*m/\Sigma pm^*m$ (%)	$pe^*e/\Sigma pe^*e$ (%)	pm^*m/p^*x (%)	pe^*e/p^*x^*xd (%)
Palay and Corn	3.70	0.30	0.25	-100.0	5.18	0.82	0.01	4.61	0.04
Fruits and Vegetables	0.85	1.50	0.37	-100.0	4.83	0.43	1.50	2.91	7.97
Coconut & Sugar	1.30	2.00	3.06	-100.0	1.78	0.07	0.13	1.41	2.11
Livestock & Poultry	1.40	0.30	0.66	-100.0	4.57	0.32	0.19	1.73	0.87
Fishing	1.10	1.50	0.20	-100.0	4.12	0.32	1.99	2.68	12.42
Other Agriculture	0.90	0.30	0.05	-100.0	1.88	1.89	0.85	23.80	10.37
Forestry	0.80	0.30	0.08	-100.0	0.89	0.24	0.15	6.88	3.77
AGRICULTURE			0.16	-100.0	23.24	4.08	4.84	5.15	5.00
Mining	1.10	1.50	0.01	-100.0	1.59	8.85	2.11	66.59	27.97
Rice & Corn Milling	2.00	0.30	0.04	-100.0	2.31	1.00	0.05	4.17	0.18
Milled Sugar	1.35	0.80	3.70	-100.0	0.79	0.11	1.00	2.15	13.99
Meat Manufacturing	1.50	0.80	0.46	-100.0	2.24	0.26	0.01	1.13	0.02
Fish Manufacturing	1.10	2.00	0.74	-100.0	0.66	0.06	0.65	1.56	12.95
Beverage & Tobacco	0.30	1.50	1.45	-100.0	1.69	0.53	0.36	6.51	4.04
Other Food Manufacturing	0.20	0.70	0.19	-100.0	4.16	2.93	2.28	10.06	6.72
Textile manufacturing	0.70	0.70	0.16	-100.0	0.66	4.26	2.63	34.74	22.01
Garments & Leather	0.20	2.50	0.26	-100.0	1.87	3.24	15.12	42.10	75.39
Wood Manufacturing	0.50	1.50	0.84	-100.0	0.97	0.14	1.81	2.66	22.16
Paper & Paper Products	0.60	0.90	0.09	-100.0	0.49	1.26	1.43	25.11	24.09
Chemical Manufacturing	0.35	1.30	0.06	-100.0	1.56	7.47	1.77	36.62	10.18
Petroleum Refining	0.60	0.30	0.87	-100.0	0.99	1.60	1.75	10.39	9.91
Non-metal manufacturing	0.60	1.50	0.15	-100.0	0.90	1.52	1.00	13.86	8.07
Metal Manufacturing	1.80	1.50	0.05	-100.0	0.79	8.21	2.62	44.06	17.33
Electrical Equipment Mfg.	1.80	3.00	0.05	-100.0	0.89	9.65	12.96	75.83	78.13
Transport & Other Mach. Mfg.	1.90	1.30	0.06	-100.0	0.40	9.69	1.10	55.21	10.54
Other Manufacturing	1.10	0.60	0.08	-100.0	0.48	4.00	8.97	50.98	66.39
Construction	0.20	0.30			6.39	0.05	0.07	0.14	0.16
Electricity, Gas and Water	0.20	0.30			2.28	0.00	0.61	0.01	4.42
INDUSTRY			0.10	-100.0	32.11	64.83	58.31	22.61	17.88
Financial Sector	0.20	0.30			3.52	2.61	0.94	17.33	6.02
Private Education	0.20	0.30			1.02	0.00	0.00	0.03	0.06
Private Health	0.20	0.30			0.96	0.09	0.14	1.82	2.35
Public Education					2.35	0.00	0.00	0.00	0.00
Public Health					0.42	0.00	0.00	0.00	0.00
General Government					3.89	0.00	0.00	0.00	0.00
Other Services	0.20	0.30			32.48	28.39	35.76	20.81	22.01
SERVICES			0.00	0.0	44.65	31.10	36.85	16.83	16.82
TOTAL			0.10	-100.0	100.00	100.00	100.00	18.16	15.58

tm: tariff rate; pva: price of value added; va: value added; pm: price of imports; m: imports; pe: price of exports; e: exports; pd: domestic price; p: composite price; px: price of output, x: composite good; xd: total output; xxd: output sold domestically.

Trade Reforms, Income Distribution and Welfare

Table 15 continued

	Volume Changes			Prices	
	δm (%)	δxxd (%)	δxd (%)	δpd (%)	δp (%)
Palay and Corn	140.93	-2.81	-2.81	2.28	1.42
Fruits and Vegetables	33.21	-0.07	-0.34	2.18	1.15
Coconut & Sugar	517.86	-0.41	-0.42	0.31	-1.31
Livestock & Poultry	106.66	-0.52	-0.52	1.71	0.88
Fishing	23.99	0.51	0.28	1.22	0.72
Other Agriculture	5.65	0.56	0.54	0.71	-0.60
Forestry	7.84	0.69	0.68	0.52	-0.08
AGRICULTURE	32.19	-0.66	-0.71	1.63	0.69
Mining	-1.08	-0.59	0.06	-1.57	-1.27
Rice & Corn Milling	11.51	0.26	0.26	1.61	1.39
Milled Sugar	702.23	0.61	0.71	-0.94	-3.45
Meat Manufacturing	79.94	0.55	0.54	1.12	0.71
Fish Manufacturing	87.67	0.56	0.26	1.13	0.27
Beverage & Tobacco	36.14	2.84	2.58	4.05	-4.28
Other Food Manufacturing	5.60	1.66	1.59	1.39	-0.67
Textile manufacturing	20.72	11.16	11.70	-3.11	-7.04
Garments & Leather	16.54	12.28	22.63	-4.67	-12.15
Wood Manufacturing	29.56	1.48	1.77	-0.86	-2.30
Paper & Paper Products	3.04	-0.93	-0.45	-2.24	-3.86
Chemical Manufacturing	2.88	1.21	1.31	-0.75	-2.45
Petroleum Refining	35.85	-2.58	-2.37	-7.13	-12.86
Non-metal manufacturing	8.74	1.43	1.72	-2.40	-3.99
Metal Manufacturing	4.53	-0.83	-0.22	-2.38	-3.63
Electrical Equipment Mfg.	5.88	3.85	14.37	-4.11	-4.89
Transport & Other Mach. Mfg.	3.12	-2.55	-2.15	-3.01	-4.58
Other Manufacturing	6.03	2.27	4.04	-4.25	-5.84
Construction	0.05	0.33	0.33	-1.35	-1.35
Electricity, Gas and Water	0.00	1.31	1.33	-1.05	-1.05
INDUSTRY	6.42	1.00	2.33	-0.96	-7.65
Financial Sector	-0.23	-0.10	-0.08	-0.69	-0.57
Private Education	2.04	1.78	1.78	-0.01	-0.01
Private Health	1.29	1.15	1.14	0.66	0.65
Public Education		-0.52	-0.52	-0.74	-0.74
Public Health		0.30	0.30	-1.47	-1.47
General Government		-18.24	-18.24	-1.50	-1.50
Other Services	1.36	1.08	0.98	1.40	1.11
SERVICES	1.22	-14.84	-1.16	0.66	0.57
TOTAL	5.62	-0.13	0.89	0.02	-1.32

tm: tariff rate; pva: price of value added; va: value added; pm: price of imports; m: imports; pe: price of exports; e: exports; pd: domestic price; p: composite price; px: price of output, x: composite good; xd: total output; xxd: output sold domestically

There were relatively few noticeable effects on the structure of the economy as a result of a complete elimination of tariff. For example, in the structure of imports, the share of agriculture imports to the total increased from 3.53 percent in the base (Table 6c) to 4.08 percent in the present scenario. The share of industrial imports, however, declined from 66.19 percent in the base to 64.83 percent, while the share imports in the service sector increased from 30.28 percent to 31.10 percent. As expected, there were no changes in the structure of exports.

In addition, there were small changes in the structure of value added. The value added share of agriculture decreased

slightly from 23.3 percent in the base (Table 4) to 23.24 percent in the present scenario (Table 15). Similarly, the share of service sector value added declined from 45.3 percent to 44.65 percent. However, the share of industry value added increased from 31.5 percent in the base to 32.11 percent.

Wages, w , declined by -0.60 percent, while the price of variable capital, rvk , increased by 3.58 percent (Table 16). The increase in the price of capital, rk , in all the agriculture subsectors was consistently below the increase in the price of variable capital. As a result of these changes in factor prices in agriculture, capital/labor ratio in all the subsectors declined, the capital/variable-capital ratio increased, and the variable-capital/labor ratio declined (Tables 12 and 16). This means that labor was used relatively more than the two factors in agriculture under the present scenario.

Mixed results were found in the case of industry, however. There were subsectors where the increase in rk was lower than the increase in rvk . In those subsectors, just like in agriculture, a similar factor movement was realized wherein the utilization of labor increased relative to the other factors. However, there were industry subsectors where the increase in rk was a lot higher than the increase in rvk . This was the case in beverage and tobacco, other food manufacturing, textile manufacturing, garments, wood manufacturing, chemical manufacturing, nonmetal manufacturing, electrical equipment, other manufacturing, and utilities. In these subsectors, factor shifts moved in favor of labor and variable capital, except in those industries that were not employing variable capital. However, in subsectors where rk declined, such as petroleum and transport manufacturing, factor movement was observed to favor capital.

The same mixed effects were observed under the services subsectors.

There were impacts observed on indirect taxes even though indirect tax rates of industries were not changed under this scenario (Table 17). These effects were due to changes in domestic sales, local prices, imports and tariff rates. Indirect taxes on agriculture and services increased, which resulted in part from the increase in the domestic price of locally sold agriculture goods. Since pd of agriculture increased by 1.63

Table 16. Production Effects (scenario: zero tariff and compensatory income taxes)

	Value Added		Factor Intensity			Sectoral Shares			Factor Prices		
	δp_{va} (%)	δv_a (%)	k/l	k/vk	vk/l	$w^*/l, w^*(\%)$	$rvk^*/vk/\Sigma rvk^*/vk(\%)$	$rk^*/\Sigma rk^*k(\%)$	$\delta w(\%)$	$\delta rvk(\%)$	$\delta rk(\%)$
Palay and Corn	3.32	-2.81	2.80	0.16	17.64	0.96	12.73	0.22	-0.60	3.58	0.42
Fruits and Vegetables	2.74	-0.34	3.87	0.96	4.05	3.12	9.53	0.99	-0.60	3.58	2.39
Cocunut & Sugar	0.60	-0.42	10.78	19.73	0.55	2.44	1.00	2.12	-0.60	3.58	0.18
Livestock & Poultry	2.93	-0.52	3.43	0.62	5.58	2.31	9.74	0.65	-0.60	3.58	2.39
Fishing	3.03	0.28	17.00	3.07	5.54	1.75	7.32	2.47	-0.60	3.58	3.32
Other Agriculture	1.53	0.54	8.34	10.54	0.79	2.55	1.52	1.74	-0.60	3.58	2.07
Forestry	2.22	0.68	31.91	81.54	0.39	0.68	0.20	1.80	-0.60	3.58	2.92
AGRICULTURE	2.67	-0.72				13.81	42.06	10.00			
Mining	0.06	0.06	12.78	79.22	0.16	2.35	0.29	2.42	-0.60	3.58	0.12
Rice & Corn Milling	2.73	0.26	51.85	23.35	2.22	0.97	1.62	4.15	-0.60	3.58	3.00
Milled Sugar	1.96	0.71	34.67			0.62		1.79	-0.60	3.58	2.68
Meat Manufacturing	2.18	0.54	28.18	33.92	0.83	1.71	1.07	3.97	-0.60	3.58	2.74
Fish Manufacturing	2.69	0.26	24.53	8.53	2.88	0.37	0.79	0.74	-0.60	3.58	2.96
Beverage & Tobacco	8.59	2.56	35.61	133.10	0.27	1.16	0.24	3.72	-0.60	3.58	11.39
Other Food Manufacturing	4.17	1.59	31.10	33.42	0.93	2.86	2.01	7.57	-0.60	3.58	5.82
Textile manufacturing	5.30	11.70	5.00	11.01	0.45	1.17	0.40	0.55	-0.60	3.58	17.61
Garments & Leather	8.68	22.63	5.67	4.31	1.31	2.17	2.15	1.32	-0.60	3.58	33.28
Wood Manufacturing	2.99	1.77	15.00	11.56	1.30	0.90	0.88	1.13	-0.60	3.58	4.81
Paper & Paper Products	0.50	-0.45	14.70	26.12	0.56	0.58	0.25	0.68	-0.60	3.58	0.05
Chemical Manufacturing	3.14	1.31	26.00	84.53	0.31	1.40	0.32	3.06	-0.60	3.58	4.50
Petroleum Refining	-24.36	-2.37	153.01			0.29		2.65	-0.60	3.58	-26.16
Non-metal manufacturing	2.64	1.72	13.80	17.92	0.77	1.01	0.59	1.17	-0.60	3.58	4.41
Metal Manufacturing	0.66	-0.22	13.29	25.34	0.52	1.00	0.39	1.07	-0.60	3.58	0.44
Electrical Equipment Mfg.	10.85	14.37	6.37			1.78		1.16	-0.60	3.58	26.77
Transport & Other Mach. Mfg.	-2.51	-2.15	9.30			0.76		0.54	-0.60	3.58	-4.60
Other Manufacturing	6.89	4.04	26.76	19.11	1.40	0.32	0.34	0.77	-0.60	3.58	11.20
Construction	0.27	0.33	6.56	34.00	0.19	12.44	1.81	6.60	-0.60	3.58	0.61
Electricity, Gas and Water	3.94	1.33	31.91			1.89		5.12	-0.60	3.58	5.32
INDUSTRY	1.83	2.22				35.74	13.13	50.17			
Financial Sector	-0.54	-0.08	17.53	361.18	0.05	4.56	0.17	6.39	-0.60	3.58	-0.63
Private Education	0.81	1.78	2.70	8.31	0.32	2.30	0.56	0.51	-0.60	3.58	2.61
Private Health	2.52	1.14	4.98	2.13	2.34	0.88	1.56	0.37	-0.60	3.58	3.70
Public Education	-0.61	-0.52	0.27			8.33		0.18	-0.60	3.58	-1.13
Public Health	-0.58	0.30	0.51			1.44		0.06	-0.60	3.58	-0.28
General Government	-1.43	-18.24	0.51			13.56		0.45	-0.60	3.58	-19.41
Other Services	3.04	0.98	19.65	6.75	2.91	19.38	42.52	31.67	-0.60	3.58	4.05
SERVICES	1.98	-1.26				50.46	44.81	39.82			
TOTAL	2.09	-0.04				100.00	100.00	100.00			

l: labor; w:wages; vk: variable capital; rvk: price of variable capital; k: capital; rk: price of capital.

Table 17. Consumption Effects (scenario: zero tariff and compensatory income taxes)

	Share	δindirect	Prices		Household Consumption Shares (%)									
	pm _i m/p _i x _i (%)	tax _i (%)	δpm _i (%)	δpd _i (%)	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Palay and Corn	4.61	3.37	-19.98	2.28	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04
Fruits and Vegetables	2.91	3.94	-27.14	2.18	6.98	6.78	6.42	6.36	6.23	5.99	5.81	5.55	5.26	4.45
Coconut & Sugar	1.41	0.73	-75.36	0.31	0.20	0.20	0.19	0.18	0.18	0.17	0.17	0.16	0.16	0.13
Livestock & Poultry	1.73	3.05	-39.67	1.71	2.16	2.10	2.01	1.99	1.96	1.90	1.86	1.80	1.73	1.55
Fishing	2.68	3.64	-16.35	1.22	6.23	6.05	5.73	5.68	5.56	5.35	5.19	4.96	4.70	3.97
Other Agriculture	23.80	2.29	-4.67	0.71	0.99	0.96	0.91	0.90	0.88	0.85	0.82	0.79	0.74	0.63
Forestry	6.88	2.24	-7.74	0.52	0.55	0.51	0.49	0.48	0.47	0.47	0.46	0.47	0.48	0.44
AGRICULTURE	5.15	3.11	-13.86	1.63	17.17	16.66	15.79	15.65	15.33	14.77	14.36	13.77	13.11	11.21
Mining	66.59	-4.31	-1.12	-1.57	0.14	0.14	0.15	0.14	0.15	0.15	0.16	0.16	0.17	0.20
Rice & Corn Milling	4.17	4.21	-3.65	1.61	12.25	11.91	11.28	11.17	10.95	10.53	10.22	9.77	9.26	7.86
Milled Sugar	2.15	1.14	-78.72	-0.94	1.43	1.39	1.32	1.30	1.28	1.23	1.19	1.14	1.08	0.91
Meat Manufacturing	1.13	3.78	-31.40	1.12	12.68	12.32	11.66	11.56	11.32	10.88	10.56	10.09	9.56	8.08
Fish Manufacturing	1.56	3.60	-42.63	1.13	2.05	1.99	1.88	1.87	1.83	1.76	1.71	1.63	1.55	1.31
Beverage & Tobacco	6.51	1.87	-59.15	4.05	3.31	3.74	3.88	3.99	4.06	4.01	3.91	3.74	3.40	2.60
Other Food Manufacturing	10.06	2.81	-16.16	1.39	12.76	12.60	12.12	12.08	11.90	11.54	11.25	10.81	10.28	8.78
Textile manufacturing	34.74	13.16	-13.87	-3.11	0.29	0.33	0.35	0.36	0.37	0.38	0.39	0.39	0.39	0.39
Garments & Leather	42.10	0.53	-20.85	-4.67	2.50	2.91	3.09	3.22	3.27	3.30	3.36	3.33	3.28	3.12
Wood Manufacturing	2.66	-0.24	-39.17	-0.86	0.63	0.63	0.75	0.73	0.75	0.84	0.89	1.00	1.13	1.44
Paper & Paper Products	25.11	-7.45	-8.44	-2.24	0.27	0.30	0.35	0.36	0.37	0.41	0.43	0.45	0.49	0.53
Chemical Manufacturing	36.62	-1.34	-5.27	-0.75	0.97	1.01	1.12	1.14	1.16	1.23	1.28	1.34	1.42	1.54
Petroleum Refining	10.39	-22.21	-46.65	-7.13	0.33	0.31	0.29	0.29	0.28	0.28	0.28	0.29	0.29	0.27
Non-metal manufacturing	13.86	-3.28	-13.09	-2.40	0.77	0.78	0.95	0.91	0.95	1.07	1.14	1.27	1.45	1.86
Metal Manufacturing	44.06	-4.35	-5.20	-2.38	0.19	0.20	0.23	0.22	0.23	0.25	0.27	0.30	0.33	0.42
Electrical Equipment Mfg.	75.83	0.48	-5.13	-4.11	1.05	1.06	1.28	1.24	1.29	1.45	1.54	1.73	1.97	2.55
Transport & Other Mach. Mfg.	55.21	-8.00	-5.86	-3.01	0.22	0.23	0.25	0.26	0.29	0.32	0.35	0.39	0.44	0.65
Other Manufacturing	50.98	-3.79	-7.35	-4.25	0.73	0.80	0.89	0.92	0.94	1.00	1.03	1.08	1.13	1.20
Construction	0.14	-2.04	0.00	-1.35	0.16	0.16	0.19	0.18	0.19	0.22	0.23	0.26	0.29	0.38
Electricity, Gas and Water	0.01	0.50	0.00	-1.05	1.54	1.45	1.37	1.35	1.31	1.31	1.30	1.33	1.35	1.24
INDUSTRY	22.61	-1.44	-9.39	-0.96	54.27	54.24	53.40	53.29	52.89	52.14	51.48	50.50	49.26	45.34
Financial Sector	17.33	-1.38	0.00	-0.69	0.47	0.53	0.60	0.63	0.65	0.71	0.74	0.79	0.85	1.22
Private Education	0.03	3.60	0.00	-0.01	1.30	1.45	1.66	1.74	1.79	1.95	2.05	2.18	2.34	2.51
Private Health	1.82	3.65	0.00	0.66	1.29	1.43	1.64	1.71	1.76	1.92	2.02	2.15	2.31	2.52
Public Education	0.00			-0.74	0.03	0.03	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.06
Public Health	0.00			-1.47	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05
General Government	0.00			-1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Services	20.81	4.56	0.00	1.40	25.43	25.64	26.83	26.90	27.50	28.44	29.25	30.53	32.04	37.09
SERVICES	16.83	3.34	0.00	0.66	28.56	29.10	30.81	31.06	31.78	33.09	34.15	35.73	37.63	43.45
TOTAL	18.16	0.81	-6.71	0.02	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

HH1: decile 1; HH2 decile 2; etc.

percent while indirect taxes increased by 3.11 percent, the local prices of these goods before taxes must have declined.

In industry, the effects were varied across subsectors, but on the whole the average price of domestically produced goods sold locally declined by -0.96 percent while indirect taxes decreased by -1.41. This indicates that local prices before taxes must have increased.

The structure of household consumption is shown in Table 10 for the base case and in Table 17 for the present scenario. Generally, one can observe that across household groups there was a decline in the share of agriculture-based consumption and an increase in the share of industry-based consumption. There were mixed effects on service sector-based consumption across the different decile groups.

Because of the decline in wages, total labor income declined by -0.52 percent (Table 18). However, there were interesting differentiated effects across household groups. One can observe that labor income improved for the first decile up to the fourth, despite the decline in wages and agriculture output, x_d . This effect can be attributed mainly to the impact on the relative factor prices in agriculture that allowed for factor shifts in favor of labor.

Furthermore, one can observe that the increase in labor income for the first four deciles became smaller as one moved to a higher decile. Labor income for the first decile increased by 1.02 percent and for the fourth decile by only 0.26 percent. This is mainly because compared to the higher income groups, lower income groups are heavily dependent on agriculture labor as source of income (Table 9).

Meanwhile, labor income from the fifth to the tenth deciles declined, and the magnitude of the drop was increasing as one moved to the higher income groups. Again, this can be attributed to the structure of labor income for these groups. Since total labor supply is assumed fixed during the simulation, the improvement of labor utilization in agriculture would imply some movement of labor from nonagriculture to agriculture. This, together with the decline in wages, resulted in a reduction, albeit small, in labor income for these groups.

As shown in Table 18, income from variable capital increased by 3.58 percent, which could be attributed mainly to the increase in the price of variable capital, rvk . Although

Simulation Results

Table 18. Effects on Sources of Income (scenario: zero tariff and compensatory income taxes)

Income from:	Change (%)	Household Income Shares (%)										
		Total	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Labor	-0.52	33.79	18.67	22.00	24.59	26.47	28.99	33.41	38.43	40.17	40.59	32.56
Variable Capital	3.58	40.66	57.35	54.14	51.90	51.39	48.81	45.62	38.98	33.94	33.09	39.08
Capital	3.71	19.40	20.49	20.43	20.34	19.13	19.11	16.69	17.13	17.29	18.78	21.29
Others	0.00	6.16	3.49	3.43	3.17	3.00	3.09	4.29	5.46	6.60	7.54	7.07
Total	1.96	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Income from:	Total	Income Change (%)										
		HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10	
Labor	-0.52	1.02	0.78	0.48	0.26	-0.09	-0.28	-0.52	-0.62	-0.74	-0.79	
Variable Capital	3.58	2.41	2.49	2.60	2.67	2.82	3.10	3.28	3.61	3.95	4.36	
Capital	3.71	3.83	3.83	3.82	3.84	3.83	3.81	3.73	3.68	3.62	3.67	
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	1.96	2.35	2.29	2.23	2.16	2.06	1.92	1.68	1.57	1.64	2.18	
Change in Direct Taxes (%)	0.06	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.03	0.05	0.11	
Change in Net Income (%)	1.90	2.34	2.28	2.22	2.15	2.05	1.91	1.66	1.54	1.59	2.07	

the increase in rvk resulted in lower utilization of variable capital relative to the other factors in many subsectors including agriculture as shown in the factor intensity results, its increase was more than enough to offset the lower utilization of this factor in these subsectors. Since all households are heavily dependent on the income from this factor, both in agriculture and nonagriculture (Table 9), the relatively sharp increase in rvk translated into a higher income from variable capital across all households. The increase, however, was relatively larger for higher income groups.

Similar effects were observed in the results on income from capital. Income from this source increased by 3.71 percent. This could be attributed mainly to the increase in the price of capital.

Thus, in terms of income distribution impact, a complete elimination of tariff resulted in favorable income effects across households. The income effect was relatively higher for lower incomes despite lower wages. Two factors may account for this: (i) the higher utilization of labor in agriculture as a result of the change in factor prices; and (ii) the sharp increase in the price of variable capital that all decile groups heavily rely on as a source of income. The effect of compensatory income is not only small but also progressive as implemented in the model.

The welfare effects across households are shown in Table 19. The income and price effects under the scenario are also presented. Overall, welfare increased by 2.17 percent of

disposable income, mainly due to the increase in income and in the reduction of prices resulting from the total elimination of tariff. The increase in welfare was slightly higher for the lower income groups.

The macroeconomic effects are shown in Table 20. One should recall in the simulation that the model was made with the following assumptions: (a) total government consumption is fixed in real terms; (b) total investment in real terms is also fixed; and (c) current account balance is fixed. The first two assumptions would not allow for real changes in the totals of these two demand variables, but would only consider reallocation across sectors as a result of changes in relative prices. The third assumption would not allow for changes in foreign savings.

What would be the impact of using actual tariff changes instead of a complete elimination of tariff? This is scenario ACTUAL_YTAX. The results are presented in Tables 21 to 26.

The change in tariff rates is shown in Table 21. The average reduction in agriculture was -56.5 percent and in industry -74.3 percent. In agriculture, the tariff in palay and corn had the smallest reduction, owing to the tariffication of QRs in the mid-1990s. In industry, sugar milling and palay and corn milling had relatively smaller tariff reduction.

Generally, in terms of direction of change, this scenario is similar to the first one, except that the magnitude of change is smaller. This is due to a less drastic cut in tariff as compared to the first one, which is a complete elimination of tariff. The drop in the composite price was -0.65 percent, with industry having the largest at -4.88 percent. The drop here can be attributed to the drop in import prices (Table 23).

The direction of the change in factor prices had been the same as in the first simulation. However, the changes were relatively smaller. For example, wage declined by only -0.06 percent. The price of variable capital increased by 2.96 percent. Factor intensities changed accordingly.

Because of a much lower decline in wages as compared to the first scenario, the decline in the overall labor income had also been smaller. Moreover, because of relatively larger labor shifts in agriculture, the increase in labor income for the lowest income brackets had also been much higher than in the previous set of results.

Simulation Results

Table 19. Income and Welfare Effects (scenario: zero tariff and compensatory income taxes)

	All	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Change in nominal Income (%)	1.96	2.35	2.29	2.23	2.16	2.06	1.92	1.68	1.57	1.64	2.18
Change in prices (%)	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32	-1.32
Equivalent Variation/Disposable Income (%)	2.17	2.39	2.41	2.41	2.36	2.28	2.17	1.94	1.84	1.89	2.34

Table 20. Macroeconomic Effects (scenario: zero tariff and compensatory income taxes)

	Base Values	Simulated Values	Difference
Government Income:	225.69	222.75	-2.93
Tariff Revenue	25.53	-	-25.53
Indirect Tax Revenue	62.34	62.43	0.08
Direct Tax Revenue	77.30	80.11	2.81
Additional Tax Revenue	-	0.82	0.82
Total Nominal Government Consumption	10.88	10.74	-0.14
Total Real Government Consumption	10.88	10.88	0.00
Price Index of Total Government Consumption	1.00	0.99	-0.01
Government Balance	(7.56)	(14.45)	-6.89
Total Nominal Investment	2,601.63	2,558.18	-43.45
Total Real Investment	2,601.63	2,601.63	0.00
Price Index of Total Investment	1.00	0.98	-0.02
Balance of Trade	(59.65)	(59.65)	0.00
Current Account Balance	(51.71)	(51.71)	0.00

The impact on income across households, however, was dominated by the increase in both the price of variable capital and of capital. Since all household groups are largely dependent on income from variable capital, either in agriculture or in industry, the large increase in its price had a favorable effect on their respective incomes. Thus, the actual reduction in tariff resulted in a favorable income distribution effect.

The impact on welfare is shown in Table 25. Again, the change in tariff using actual reduction results was found to be welfare-improving. Total welfare improved by 1.45 percent of disposable income. There were no wide variations in the welfare effects across deciles. The effects on the lower income groups were slightly higher than on the higher income groups. The welfare effects were due to higher income and lower prices.

The macroeconomic effects of the present tariff scenario are presented in Table 26.

Table 21. Trade Effects (scenario: actual tariff and compensatory income taxes)

	Elasticities		Tariff Rate		Sectoral Shares				
	armington	CET	tm,0	Δtm, (%)	pva ₁ *va ₁ /Σ.pva ₁ *va ₁ (%)	pm ₁ *m ₁ /Σ.pm ₁ *m ₁ (%)	pe ₁ *e ₁ /Σ.pe ₁ *e ₁ (%)	pm ₁ *m ₁ /p ₁ *x ₁ (%)	pe ₁ *e ₁ /p ₁ *xd ₁ (%)
Fruits and Vegetables	0.85	1.50	0.37	-70.1	4.82	0.43	1.54	2.96	8.02
Coconut & Sugar	1.30	2.00	3.06	-69.9	1.80	0.06	0.14	1.16	2.08
Livestock & Poultry	1.40	0.30	0.66	-68.1	4.57	0.30	0.20	1.60	0.87
Fishing	1.10	1.50	0.20	-83.0	4.11	0.31	2.04	2.68	12.43
Other Agriculture	0.90	0.30	0.05	-55.0	1.88	1.89	0.87	23.84	10.35
Forestry	0.80	0.30	0.08	-83.1	0.88	0.24	0.16	6.90	3.77
AGRICULTURE			0.16	-56.5	23.36	3.70	4.96	4.69	4.98
Mining	1.10	1.50	0.01	-87.7	1.59	8.87	2.15	66.60	27.73
Rice & Corn Milling	2.00	0.30	0.04	-17.2	2.29	0.97	0.05	4.05	0.18
Milled Sugar	1.35	0.80	3.70	-14.6	0.80	0.07	1.02	1.32	13.70
Meat Manufacturing	1.50	0.80	0.46	-79.0	2.24	0.25	0.01	1.08	0.02
Fish Manufacturing	1.10	2.00	0.74	-78.1	0.66	0.06	0.67	1.54	12.95
Beverage & Tobacco	0.30	1.50	1.45	-75.2	1.64	0.64	0.37	7.99	4.12
Other Food Manufacturing	0.20	0.70	0.19	-65.6	4.10	3.06	2.32	10.53	6.72
Textile manufacturing	0.70	0.70	0.16	-75.4	0.63	4.16	2.57	34.94	21.71
Garments & Leather	0.20	2.50	0.26	-62.0	1.70	3.37	14.31	43.66	74.34
Wood Manufacturing	0.50	1.50	0.64	-70.4	0.96	0.15	1.83	2.89	21.96
Paper & Paper Products	0.60	0.90	0.09	-76.1	0.49	1.28	1.46	25.21	23.80
Chemical Manufacturing	0.35	1.30	0.06	-74.0	1.55	7.51	1.80	36.77	10.09
Petroleum Refining	0.60	0.30	0.87	-77.0	1.08	1.75	1.80	11.02	9.70
Non-metal manufacturing	0.60	1.50	0.15	-69.0	0.90	1.55	1.01	14.04	7.92
Metal Manufacturing	1.80	1.50	0.05	-69.9	0.79	8.21	2.66	43.90	17.04
Electrical Equipment Mfg.	1.80	3.00	0.05	-83.2	0.83	9.59	12.66	75.85	77.39
Transport & Other Mach. Mfg.	1.90	1.30	0.06	-65.9	0.40	9.78	1.12	54.99	10.31
Other Manufacturing	1.10	0.60	0.08	-80.1	0.45	4.02	8.88	51.01	65.48
Construction	0.20	0.30			6.42	0.05	0.07	0.14	0.16
Electricity, Gas and Water	0.20	0.30			2.26	0.00	0.62	0.01	4.40
INDUSTRY			0.10	-74.3	31.79	65.36	57.39	22.75	17.27
Financial Sector	0.20	0.30			3.54	2.61	0.97	17.28	5.99
Private Education	0.20	0.30			1.02	0.00	0.00	0.03	0.06
Private Health	0.20	0.30			0.96	0.09	0.14	1.82	2.35
Public Education					2.38	0.00	0.00	0.00	0.00
Public Health					0.42	0.00	0.00	0.00	0.00
General Government					4.24	0.00	0.00	0.00	0.00
Other Services	0.20	0.30			32.28	28.24	36.53	20.82	22.02
SERVICES			0.00	0.0	44.85	30.94	37.65	16.69	16.68
TOTAL			0.10	-73.4	100.00	100.00	100.00	18.13	15.20

tm: tariff rate; pva: price of value added; va: value added; pm: price of imports; m: imports; pe: price of exports; e: exports; pd: domestic price; p: composite price; px: price of output, x: composite good; xd: total output; xxd: output sold domestically.

Table 21 continued

	Volume Changes			Prices	
	δm_i (%)	δx_{xd} (%)	δx_d (%)	δp_d (%)	δp_c (%)
Palay and Corn	14.63	-0.38	-0.38	2.01	1.91
Fruits and Vegetables	21.45	-0.14	-0.37	1.94	1.24
Coconut & Sugar	167.10	-0.03	-0.06	0.73	-0.06
Livestock & Poultry	58.35	-0.37	-0.37	1.63	1.12
Fishing	19.33	0.31	0.09	1.19	0.78
Other Agriculture	3.59	0.40	0.38	0.88	0.04
Forestry	6.38	0.43	0.43	0.53	0.03
AGRICULTURE	11.53	-0.11	-0.18	1.54	1.03
Mining	-0.82	-0.71	-0.27	-1.09	-1.02
Rice & Corn Milling	4.85	-0.05	-0.05	1.78	1.68
Milled Sugar	19.70	1.01	0.96	0.41	0.25
Meat Manufacturing	56.51	0.28	0.28	1.18	0.88
Fish Manufacturing	58.70	0.37	0.08	1.12	0.49
Beverage & Tobacco	22.77	1.94	1.73	3.22	-2.86
Other Food Manufacturing	3.60	1.03	0.96	1.38	-0.01
Textile manufacturing	13.48	6.64	6.99	-2.14	-5.15
Garments & Leather	10.13	7.80	14.28	-3.13	-7.64
Wood Manufacturing	18.41	0.96	1.09	-0.37	-1.36
Paper & Paper Products	2.35	-0.79	-0.49	-1.42	-2.72
Chemical Manufacturing	2.13	0.83	0.87	-0.33	-1.67
Petroleum Refining	23.84	-1.96	-1.80	-5.43	-9.69
Non-metal manufacturing	5.84	0.96	1.15	-1.57	-2.68
Metal Manufacturing	3.03	-0.76	-0.36	-1.61	-2.50
Electrical Equipment Mfg.	4.47	2.15	9.69	-3.06	-3.98
Transport & Other Mach. Mfg.	2.06	-1.68	-1.42	-1.95	-3.00
Other Manufacturing	5.07	0.26	0.97	-1.79	-3.90
Construction	0.10	0.23	0.23	-0.73	-0.73
Electricity, Gas and Water	0.00	0.89	0.90	-0.70	-0.70
INDUSTRY	4.23	0.55	1.37	-0.41	-4.88
Financial Sector	-0.20	-0.15	-0.15	-0.27	-0.22
Private Education	2.04	1.24	1.24	0.29	0.29
Private Health	0.94	0.77	0.76	0.78	0.77
Public Education		-0.38	-0.38	-0.19	-0.19
Public Health		0.25	0.25	-0.76	-0.76
General Government		-11.95	-11.95	-0.74	-0.74
Other Services	0.93	0.66	0.57	1.35	1.06
SERVICES	0.83	-9.66	-0.82	0.81	0.68
TOTAL	3.38	-0.09	0.52	0.33	-0.65

tm: tariff rate; pva: price of value added; va: value added; pm: price of imports; m: imports; pe: price of exports; e: exports; pd: domestic price; p: composite price; px: price of output; x: composite good; xd: total output; xxd: output sold domestically.

Table 22. Production Effects (scenario: actual tariff and compensatory income taxes)

	Value Added		Factor Intensity			Sectoral Shares			Factor Prices		
	$\delta pva_i(\%)$	$\delta va_i(\%)$	k_i/l_i	k_i/vk_i	vk_i/l_i	$w_i^*/\sum w_i^*(\%)$	$rvk_i^*vk_i/\sum rvk_i^*vk_i(\%)$	$rk_i^*/\sum rk_i^*(\%)$	$\delta w(\%)$	$\delta rvk_i(\%)$	$\delta rk_i(\%)$
Palay and Corn	2.80	-0.38	2.76	0.15	17.84	0.97	13.06	0.22	-0.06	2.96	2.41
Fruits and Vegetables	2.35	-0.37	3.91	0.95	4.10	3.09	9.55	1.00	-0.06	2.96	1.97
Coconut & Sugar	0.98	-0.06	10.76	19.47	0.55	2.44	1.02	2.15	-0.06	2.96	0.92
Livestock & Poultry	2.49	-0.37	3.46	0.61	5.65	2.30	9.78	0.96	-0.06	2.96	2.12
Fishing	2.53	0.09	17.21	3.07	5.61	1.73	7.32	2.48	-0.06	2.96	2.62
Other Agriculture	1.47	0.38	8.41	10.50	0.80	2.53	1.53	1.75	-0.06	2.96	1.86
Forestry	1.82	0.43	32.29	81.59	0.40	0.67	0.20	1.80	-0.06	2.96	2.25
AGRICULTURE	2.31	-0.18				13.73	42.45	10.06			
Mining	0.07	-0.27	12.89	79.00	0.16	2.33	0.29	2.43	-0.06	2.96	-0.20
Rice & Corn Milling	1.95	-0.05	52.70	23.46	2.25	0.95	1.61	4.13	-0.06	2.96	1.90
Milled Sugar	3.43	0.96	34.28			0.63		1.83	-0.06	2.96	4.43
Meat Manufacturing	1.77	0.26	26.52	33.94	0.84	1.69	1.07	3.98	-0.06	2.96	2.06
Fish Manufacturing	2.25	0.08	24.82	8.53	2.91	0.36	0.79	0.74	-0.06	2.96	2.33
Beverage & Tobacco	6.12	1.73	36.94	136.51	0.27	1.12	0.23	3.63	-0.06	2.96	7.96
Other Food Manufacturing	3.06	0.96	31.80	33.78	0.94	2.80	1.99	7.50	-0.06	2.96	4.06
Textile manufacturing	3.67	6.99	5.33	11.60	0.46	1.10	0.38	0.52	-0.06	2.96	10.91
Garments & Leather	6.12	14.28	6.27	4.71	1.33	1.96	1.97	1.21	-0.06	2.96	21.28
Wood Manufacturing	2.41	1.09	15.27	11.64	1.31	0.88	0.87	1.13	-0.06	2.96	3.52
Paper & Paper Products	0.58	-0.49	14.77	25.95	0.57	0.58	0.25	0.69	-0.06	2.96	0.09
Chemical Manufacturing	2.49	0.67	26.42	84.93	0.31	1.38	0.32	3.05	-0.06	2.96	3.38
Petroleum Refining	-18.75	-1.80	142.38			0.31		2.89	-0.06	2.96	-20.22
Non-metal manufacturing	2.21	1.15	14.01	17.99	0.78	0.99	0.58	1.17	-0.06	2.96	3.38
Metal Manufacturing	0.68	-0.36	13.38	25.22	0.53	0.99	0.40	1.08	-0.06	2.96	0.33
Electrical Equipment Mfg.	7.73	9.68	6.87			1.65		1.08	-0.06	2.96	18.16
Transport & Other Mach. Mfg.	-1.33	-1.42	9.17			0.77		0.56	-0.06	2.96	-2.73
Other Manufacturing	2.93	0.97	28.79	20.33	1.42	0.30	0.32	0.72	-0.06	2.96	3.93
Construction	0.57	0.23	6.58	30.73	0.20	12.40	1.82	6.66	-0.06	2.96	0.80
Electricity, Gas and Water	3.02	0.90	32.50			1.86		5.09	-0.06	2.96	3.95
INDUSTRY	1.43	1.35				35.04	12.88	50.07			
Financial Sector	-0.16	-0.15	17.57	357.89	0.05	4.55	0.17	6.46	-0.06	2.96	-0.31
Private Education	0.95	1.24	2.72	8.29	0.33	2.28	0.56	0.51	-0.06	2.96	2.21
Private Health	2.19	0.76	5.05	2.14	2.36	0.87	1.56	0.37	-0.06	2.96	2.97
Public Education	-0.07	-0.39	0.26			8.34		0.18	-0.06	2.96	-0.46
Public Health	-0.05	0.25	0.51			1.44		0.06	-0.06	2.96	0.20
General Government	-0.59	-11.95	0.47			14.64		0.49	-0.06	2.96	-12.47
Other Services	2.50	0.57	19.94	6.78	2.94	19.09	42.38	31.80	-0.06	2.96	3.08
SERVICES	1.75	-0.89				51.23	44.67	39.87			
TOTAL	1.78	-0.02				60.00	100.00	100.00			

l: labor; w:wages; vk: variable capital; rvk: price of variable capital; k: capital; rk: price of

Table 23. Consumption Effects (scenario: actual tariff and compensatory income taxes)

	Share	Indirect tax (%)	Prices		Household Consumption Shares (%)									
	pm ₁ */p ₁ *x (%)		βpm (%)	δpd (%)	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Palay and Corn	2.69	3.79	-1.79	2.01	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.04
Fruits and Vegetables	2.96	3.44	-19.03	1.94	7.01	6.81	6.45	6.39	6.25	6.01	5.84	5.57	5.28	4.46
Coconut & Sugar	1.16	1.88	-52.71	0.73	0.20	0.20	0.18	0.18	0.18	0.17	0.17	0.16	0.15	0.13
Livestock & Poultry	1.60	2.55	-27.91	1.63	2.16	2.10	2.01	2.00	1.97	1.90	1.86	1.80	1.73	1.55
Fishing	2.68	3.13	-13.57	1.19	6.26	6.08	5.76	5.71	5.59	5.37	5.21	4.98	4.72	3.99
Other Agriculture	23.84	2.42	-2.57	0.88	0.99	0.96	0.91	0.90	0.89	0.85	0.82	0.78	0.74	0.63
Forestry	6.90	1.79	-6.44	0.53	0.55	0.52	0.49	0.48	0.47	0.47	0.47	0.48	0.45	0.44
AGRICULTURE	4.69	3.08	-8.09	1.54	17.23	16.72	15.85	15.71	15.39	14.83	14.42	13.82	13.16	11.25
Mining	66.60	-3.56	-0.98	-1.09	0.14	0.14	0.15	0.14	0.15	0.15	0.16	0.16	0.16	0.20
Rice & Corn Milling	4.05	3.69	-0.63	1.78	12.28	11.93	11.30	11.20	10.97	10.55	10.25	9.79	9.28	7.87
Milled Sugar	1.32	2.99	-11.50	0.41	1.38	1.35	1.27	1.26	1.24	1.19	1.15	1.10	1.05	0.88
Meat Manufacturing	1.08	3.27	-24.60	1.18	12.72	12.36	11.70	11.60	11.36	10.92	10.60	10.12	9.59	8.11
Fish Manufacturing	1.54	3.17	-33.31	1.12	2.05	1.99	1.89	1.87	1.83	1.75	1.71	1.64	1.55	1.32
Beverage & Tobacco	7.99	1.71	-44.47	3.22	3.28	3.76	3.84	3.65	4.02	3.97	3.87	3.70	3.37	2.57
Other Food Manufacturing	10.53	2.61	-10.61	1.38	12.73	12.58	12.10	12.06	11.85	11.52	11.24	10.80	10.27	8.76
Textile manufacturing	34.94	6.88	-10.45	-2.14	0.28	0.32	0.34	0.36	0.36	0.37	0.38	0.38	0.39	0.39
Garments & Leather	43.66	1.05	-12.92	-3.13	2.39	2.78	2.96	3.08	3.12	3.16	3.21	3.19	3.13	2.98
Wood Manufacturing	2.89	0.18	-27.57	-0.37	0.63	0.63	0.75	0.72	0.75	0.83	0.89	0.99	1.12	1.43
Paper & Paper Products	25.21	-5.37	-6.42	-1.42	0.27	0.30	0.35	0.36	0.37	0.40	0.43	0.45	0.49	0.53
Chemical Manufacturing	36.77	-0.77	-3.90	-0.33	0.96	1.01	1.11	1.13	1.15	1.22	1.27	1.34	1.42	1.54
Petroleum Refining	11.02	-17.15	-35.93	-5.43	0.32	0.30	0.28	0.28	0.27	0.27	0.27	0.28	0.28	0.26
Non-metal manufacturing	14.04	-2.14	-9.03	-1.57	0.77	0.77	0.94	0.90	0.94	1.06	1.13	1.26	1.44	1.85
Metal Manufacturing	43.90	-3.26	-3.64	-1.81	0.19	0.20	0.23	0.22	0.23	0.25	0.27	0.30	0.33	0.42
Electrical Equipment Mfg.	75.85	-0.46	-4.27	-3.06	1.05	1.05	1.28	1.23	1.28	1.44	1.54	1.73	1.96	2.54
Transport & Other Mach. Mfg.	54.99	-5.25	-3.86	-1.95	0.22	0.22	0.25	0.26	0.29	0.31	0.34	0.39	0.43	0.64
Other Manufacturing	51.01	-2.61	-5.89	-1.79	0.72	0.79	0.88	0.90	0.93	0.98	1.02	1.06	1.11	1.18
Construction	0.14	-1.00	0.00	-0.73	0.16	0.16	0.19	0.18	0.19	0.21	0.23	0.26	0.29	0.38
Electricity, Gas and Water	0.01	0.39	0.00	-0.70	1.64	1.45	1.37	1.35	1.31	1.31	1.31	1.33	1.35	1.25
INDUSTRY	22.75	-0.92	-6.75	-0.41	54.07	54.03	53.18	53.07	52.66	51.91	51.25	50.26	49.02	45.09
Financial Sector	17.28	-0.76	0.00	-0.27	0.47	0.53	0.60	0.63	0.65	0.71	0.74	0.79	0.85	1.22
Private Education	0.03	3.11	0.00	0.29	1.31	1.45	1.67	1.75	1.80	1.95	2.06	2.18	2.34	2.52
Private Health	1.82	3.12	0.00	0.78	1.30	1.44	1.65	1.72	1.77	1.92	2.03	2.16	2.32	2.53
Public Education	0.00			-0.19	0.03	0.03	0.04	0.05	0.04	0.04	0.05	0.05	0.05	0.06
Public Health	0.00			-0.76	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05
General Government	0.00			-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Services	20.82	3.60	0.00	1.35	25.56	25.77	26.98	27.05	27.66	28.60	29.42	30.70	32.22	37.29
SERVICES	16.69	2.68	0.00	0.81	28.70	29.25	30.97	31.22	31.95	33.26	34.33	35.92	37.82	43.66
TOTAL	18.13	0.85	-4.76	0.33	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

HH1: decile 1; HH2 decile 2; etc.

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Table 24. Effects on Sources of Income (scenario: actual tariff and compensatory income taxes)

Income from:	Change (%)	Household Income Shares (%)										
		Total	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Labor	-0.06	34.04	18.73	22.08	24.70	26.60	29.15	33.61	38.67	40.44	40.89	32.87
Variable Capital	2.96	40.53	57.47	54.23	51.96	51.43	48.81	45.55	38.88	33.79	32.91	38.86
Capital	2.68	19.25	20.31	20.25	20.16	18.96	18.95	16.55	16.98	17.15	18.64	21.17
Others	0.00	6.18	3.50	3.43	3.17	3.01	3.09	4.29	5.47	6.62	7.56	7.10
Total	1.67	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Income from:	Change (%)	Income Change (%)										
		Total	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Labor	-0.06	1.18	0.99	0.74	0.57	0.29	0.13	-0.06	-0.13	-0.23	-0.27	
Variable Capital	2.96	2.45	2.48	2.54	2.57	2.63	2.75	2.83	2.88	3.13	3.31	
Capital	2.66	2.74	2.74	2.74	2.75	2.74	2.73	2.67	2.64	2.59	2.63	
Others	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	1.67	2.18	2.12	2.05	1.98	1.88	1.73	1.51	1.38	1.40	1.73	
Change in Direct Taxes (%)	0.04	0.00	0.01	0.00	0.01	0.01	0.01	0.02	0.02	0.04	0.07	
Change in Net Income (%)	1.64	2.18	2.11	2.04	1.96	1.87	1.72	1.50	1.36	1.36	1.65	

Table 25. Income and Welfare Effects (scenario: actual tariff and compensatory income taxes)

	All	HH1	HH2	HH3	HH4	HH5	HH6	HH7	HH8	HH9	HH10
Change in nominal Income (%)	1.67	2.18	2.12	2.05	1.98	1.88	1.73	1.51	1.38	1.40	1.73
Change in prices (%)	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65	-0.65
Equivalent Variation/Disposable Income (%)	1.45	1.80	1.79	1.77	1.72	1.63	1.51	1.31	1.19	1.21	1.51

Table 26. Macroeconomic Effects (scenario: actual tariff and compensatory income taxes)

	Base Values	Simulated Values	Difference
Government Income:	225.69	224.33	-1.36
Tariff Revenue	25.53	8.36	-17.17
Indirect Tax Revenue	62.34	62.43	0.09
Direct Tax Revenue	77.30	79.37	2.07
Additional Tax Revenue	-	0.55	0.55
Total Nominal Government Consumption	10.88	10.82	-0.07
Total Real Government Consumption	10.88	10.88	0.00
Price Index of Total Government Consumption	1.00	0.99	-0.01
Government Balance	(7.56)	(12.37)	-4.80
Total Nominal Investment	2,601.63	2,576.40	-25.24
Total Real Investment	2,601.63	2,601.63	0.00
Price Index of Total Investment	1.00	0.99	-0.01
Balance of Trade	(59.65)	(59.65)	0.00
Current Account Balance	(51.71)	(51.71)	0.00

VI



Conclusion

Results of the study show that the reduction of tariff rates is welfare-improving across household groups, although the size of the improvement is not too significant (only about 2 percent of disposable income).

The forces at work are both the improvement in income and the reduction in prices of commodities and services. Although wage declined as a result of tariff reduction, changes in factor prices resulted in factor shifts that favored labor, especially in agriculture. Furthermore, the price of variable capital and the income derived from it, officially called mixed income, improved significantly during the tariff reduction simulations. Since all household groups are sourcing their respective incomes significantly from this factor (mixed income in agriculture for lower income groups and mixed income in nonagriculture for higher income groups), the increase was found to benefit all groups almost evenly. The treatment of variable capital in the model is similar to labor, which is mobile across sectors.

Appendix
Equations and Variables: PCGEM Model

CORE EQUATIONS IN PCGEM	DESCRIPTION
$pm_u = pwm_u \cdot er \cdot (1 + tm_u) \cdot (1 + itxrdom_u)$	Import price
$pe_u \cdot (1 + te_u) = pwe_u \cdot er$	Export price
$p_u \cdot x_u = pd_u \cdot xxd_u + pm_u \cdot imp_u$	Composite price, tradable
$p_{in} = pd_{in}$	Composite price for nontradable
$px_u \cdot xd_u = pl_u \cdot xxd_u + pe_u \cdot exp_u$	Sales price, tradable
$px_{in} = pl_{in}$	Sales price, nontradable
$pd_i = pl_i \cdot (1 + itxrdom_i)$	Domestic prices
$pva_i \cdot va_i = px_i \cdot xd_i - \sum_j id_{ij} \cdot p_j$	Value added price
$pk_i = p_i$	Price of capital
$xd_i \cdot vt = va_i$	Supply
$ri = inp_i \cdot xd_i$	Intermediate input
$id_{ij} = aij_{ij} \cdot ri_j$	Matrix of intermediate input
$va_{w_vt} = ad_{w_vt} \cdot l_{w_vt}^{\alpha_{w_vt}} \cdot v_{w_vt}^{\beta_{w_vt}} \cdot k_{w_vt}^{\gamma_{w_vt}}$	Value added, sectors w/ variable capital
$va_{n_vt} = ad_{n_vt} \cdot l_{n_vt}^{\alpha_{n_vt}} \cdot v_{n_vt}^{\beta_{n_vt}} \cdot k_{n_vt}^{\gamma_{n_vt}}$	Value added, sectors w/o variable capital
$l_i \cdot wage = va_i \cdot pva_i \cdot \alpha_i$	Demand for labor
$v_{w_vt} \cdot rvk = va_{w_vt} \cdot pva_{w_vt} \cdot \beta_{w_vt}$	Demand for variable capital
$rkap_{w_vt} \cdot k_{w_vt} = pva_{w_vt} \cdot va_{w_vt} - wage \cdot l_{w_vt} - rvk \cdot v_{w_vt}$	Returns to capital in sectors with variable capital

Appendix

$rkap_{n_vk} \cdot k_{n_vk} = pva_{n_vk} \cdot va_{n_vk} - wage \cdot l_{n_vk} - rvk \cdot v_{n_vk}$	Returns to capital in sectors without variable capital
$xd_u = at_u \cdot (\theta_u \cdot \exp_u^{\kappa - \epsilon_u} + (1 - \theta_u) \cdot xxd_u^{\kappa - \epsilon_u})^{(1/\kappa - \epsilon_u)}$	Composite supply, CET, tradable
$xd_{in} = xxd_{in}$	supply, nontradable
$\exp_u = xxd_u \cdot \left[\frac{pe_u}{pl_u} \cdot \left(\frac{1 - \theta_u}{\theta_u} \right) \right]^{\sigma - \epsilon_u}$	Export supply
$x_u = ac_u \cdot (\delta_u \cdot imp_u^{-\rho - m_u} + (1 - \delta_u) \cdot xxd_u^{-\rho - m_u})^{(-1/\rho - m_u)}$	Composite good, CES, tradable
$x_{in} = xxd_{in}$	Nontradable good
$imp_u = xxd_u \cdot \left[\frac{pd_u}{pm_u} \cdot \left(\frac{1 - \delta_u}{\delta_u} \right) \right]^{\sigma - m_u}$	Import demand
$ylbag = wage \cdot \sum_{ag} l_{ag}$	Labor income in agriculture
$ylbnag = wage \cdot \sum_{nag} l_{nag}$	Labor income in nonagriculture
$yvkag = rvk \cdot \sum_{ag_vk} v_{ag_vk}$	Variable capital income in agriculture
$yvknag = rvk \cdot \sum_{nag_vk} v_{nag_vk}$	Variable capital income in nonagriculture
$ykap = \sum_i rkap_i \cdot k_i - \sum_i depr_i \cdot k_i \cdot pk_i$	Capital income
$pri_inc_{inst1} = dylbag_{inst1} \cdot ylbag + dylbnag_{inst1} \cdot ylbnag + dylbocw_{inst1} \cdot er \cdot ww \cdot ocw + dyvkag_{inst1} \cdot yvkag + dyvknag_{inst1} \cdot yvknag + dykap_{inst1} \cdot ykap + \sum_{inst2} sec_dinc_{inst1,inst2} \cdot pri_inc_{inst2} + gv_tran_{inst1} + er \cdot for_tran_{inst1}$	Income of institution, except government
$gv_inc = \sum_{it} tm_{it} \cdot imp_{it} \cdot pwm_{it} \cdot er + \sum_{it} itxrdom_{it} \cdot imp_{it} \cdot pwm_{it} \cdot er \cdot (1 + tm_{it}) + \sum_{it} te_{it} \cdot \exp_{it} \cdot pe_{it} + \sum_i itxrdom_i \cdot pl_i \cdot xxd_i + dykap_{gv} \cdot ykap + \sum_{inst1} dtaxr_{inst1} \cdot pri_inc_{inst1} + gv_dtax + er \cdot for_tran_{gv}$	Government income
$dispy_{inst1} = pri_inc_{inst1} \cdot (1 - dtaxr_{inst1})$	Disposable income

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$pri_save_{inst1} = pri_inc_{inst1} \cdot (1 - dtax_{inst1}) - \sum_{inst1} pri_cc_{inst1,j} \cdot p_i - \sum_{inst2} sec\ dinc_{inst2,inst1} \cdot pri_inc_{inst1} - er \cdot for_pay_{inst1}$	Savings of institutions, except government
$int_i = \sum_j id_{i,j}$	Intermediate demand
$pri_cc_{inst1,i} = dccmt_{inst1,i} \cdot apc_{inst1} \cdot dispy_{inst1}$	Consumption of institutions except government
$inv_i \cdot p_i = divn_i \cdot (tinu - \sum_j chstk_j \cdot p_j)$	Sectoral Investment
$cab = \sum_{ii} (pwm_{ii} \cdot imp_{ii} - pwe_{ii} \cdot exp_{ii}) - ww \cdot ocw + \frac{1}{er} \cdot wage \cdot for_lb + \sum_{inst} for_pay_{inst} - \sum_{inst} for_tran_{inst}$	Balance of payments
$tinu = \sum_{inst1} pri_save_{inst1} + gv_save + cab \cdot er + \sum_i depr_i \cdot k_i \cdot pk_i$	Total Investment equals total savings
$sup\ lbag + sup\ lbnag + for_lb = \sum_i l_i$	Labor market equilibrium
$sup\ vkag + sup\ vknag = \sum_{w_vk} v_{w_vk}$	Variable capital equilibrium
$x_{alxgv-se} = int_{alxgv-se} + \sum_{inst1} pri_cc_{alxgv-se,inst1} + gv_cc_{alxgv-se} + inv_{alxgv-se} + chstk_{alxgv-se}$	Product market equilibrium except in general government sector
$walras = x_{gv-se} - int_{gv-se} - \sum_{inst1} pri_cc_{gv-se,inst1} - gv_cc_{gv-se} - inv_{gv-se} + chstk_{gv-se}$	Walras law

Variables

*** Output and input prices

pm ^(it)	domestic price of imports for tradables
pwm ^(it)	world prices of imports for tradables
pe ^(it)	domestic price of exports
pwe ^(it)	world prices of exports
er	exchange rate
p ⁽ⁱ⁾	composite prices
pd ⁽ⁱ⁾	domestic prices
p1 ⁽ⁱ⁾	domestic prices without domestic indirect taxes
px ⁽ⁱ⁾	sales prices
pk ⁽ⁱ⁾	capital good prices
pva ⁽ⁱ⁾	value added prices
pindex ⁽ⁱ⁾	price index also called GDP deflator
wage	average wage rate
rvk	average return to variable capital
rkap ⁽ⁱ⁾	sectoral return to capital
ww	international wage rate

Appendix

*** Taxes	
tm _(a)	tariff rates
te _(a)	export tax or subsidies
itxrdom _(i)	domestic indirect tax rates
dtax _(inst1)	direct income tax rates
gv_dtax	value of direct income tax on government sector
*** Output, value added and trade variables	
x _(i)	composite commodities
xxd _(i)	xd less exports
xd _(i)	column sums in the SAM less imports
va _(i)	value added
ri _(i)	vector sums of intermediate inputs
id _(i)	matrix of intermediate inputs
imp _(i)	imports
exp _(i)	exports
*** Factor inputs	
l _(i)	demand for labor
v _(w_vk)	demand for variable capital
k _(i)	demand for capital
suplbg	total supply of agriculture labor
suplnag	total supply of nonagriculture labor
ocw	overseas contract workers
supvkag	total supply of variable capital in agriculture
supvknag	total supply of variable capital in nonagriculture
*** Income and savings	
ylbg	labor income in agriculture
ylbnag	labor income in nonagriculture
yvkag	variable capital income in agriculture
yvknag	variable capital income in nonagriculture
ykap	capital income except government
pri_inc _(inst1)	income of institutions
gv_inc	income of government
dispy _(inst1)	disposable income of institutions
pri_save _(inst1)	savings of institutions except government
gv_save	savings of government
tinv	total investible funds equal to total savings
depr _(i)	depreciation
cab	current account balance
*** Demand	
int _(i)	intermediate demand
pri_cc _(inst1,i)	consumption demand of institutions except government
gv_cc _(i)	consumption of government
inv _(i)	sectoral investment
chstk _(i)	sectoral change in stocks
*** Transfers	
for_tran _(inst)	foreign transfers to institutions
for_pay _(inst)	interest payments to ROW
gv_tran _(inst1)	government transfers to institutions
for_lb	labor payments to foreign labor
*** Walras law	
walras	variable to capture walras law

