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Growth, Globalization, and Gains from the Uruguay Round

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What will be the effect of the Uruguay Round agreement in 2005, the final year of its implementation? A projections approach to the analysis of gradual policy reform captures the interaction between economic growth and changing comparative advantage, on the one hand, and policy reform, on the other.

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Summary findings

Emphasizing the importance of evaluating the Uruguay Round in the context of a changing world economy, Hertel, Bach, Dimaranan, and Martin base their projections on a model that incorporates certain economic shifts:

- That the center of economic gravity will shift toward the South and toward Asia (a shift that is already under way and shows no signs of abating).
- That the pattern of comparative advantage will continue to change, with the East Asian economies gaining comparative advantage in the production of physical and human-capital-intensive products.

The authors argue that these changes in the global economy significantly affects their analysis of the Uruguay Round reforms, for two reasons. First, with the global distribution of trade and production shifting toward Asia, the deeper Uruguay Round cuts in that region become more important, giving rise to a 17 percent increase in the proportionate welfare gain after implementation of tariff cuts. Second, without the Round, almost all of the bilateral quotas associated with the Multifibre Arrangement (MFA) would have become more binding and the resulting distortion would have been significantly greater. In this analysis, the global gain from MFA reform is 60 percent greater than it would have been without taking into account the effects of growth.

Of course, procedures for implementation of the MFA reforms are more complex than they have conveyed for purposes of analysis. In practice, one must also consider the impact of accelerated quota growth under the Agreement on Textiles and Clothing. But even when the Agreement on Textiles and Clothing is implemented over the period for which projections were made, quota rents rise for many bilateral flows. This is a consequence both of shifts in comparative advantage toward the supplying countries and of simultaneous cuts in tariffs on textiles and clothing.

The projections approach used here may be viewed as a logical extension of the growing econometric literature seeking to explain the determinants of economic growth through regression analysis. By offering a bridge between econometric evidence and computable general equilibrium modeling, the authors hope to combine the two approaches to help shed light on the interaction between trade reform and economic growth.

This paper — a product of the International Trade Division, International Economics Department — is part of a larger effort in the department to analyze the impact of the Uruguay Round on developing countries. The study was funded by the Bank's Research Support Budget under the research project "Implications of the Uruguay Round for the Developing Economies" (RPO 679-04). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Audrey Kitson-Walters, room N5-039, telephone 202-473-2947, fax 202-522-1159, Internet address trade@worldbank.org. May 1996. (34 pages)

Growth, Globalization, and the Gains from the Uruguay Round

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1. Introduction

Traditionally, growth studies focusing on the main determinants of economic growth have used econometric techniques, growth forecasts have used macroeconomic models, while detailed policy analyses have been done in applied general equilibrium (AGE) models within a base year. This study is an attempt to bridge these efforts and combine evidence given by growth regressions and macroeconomic forecasts with a detailed policy analysis of the Uruguay Round.

Comparative static AGE analyses of policy reform typically look at policy shocks in isolation. For example, most studies of the Uruguay Round Agreement have asked the question: "What would be the effect on the world economy in the base year (e.g. 1992) had the Uruguay Round been introduced and had its full effect in that year?" These studies necessarily abstract from interactions with other changes which might be occurring simultaneously. This is not a big problem when the contemporaneous changes are unimportant. However, this is not the case with policy reforms such as those agreed to under the Uruguay Round. These are due to be phased in over a 10 year period. Here, the appropriate question is as follows: "What will be the effect of the Uruguay Round Agreement on the world economy in the year 2005, after it has been fully implemented?"

In an earlier study (Hertel, *et al.*, 1995), we examined the implications of the Uruguay Round in the context of a changing world economy. The results of this analysis were useful since they allowed comparisons between the amount of adjustment required by the Uruguay Round and the amount required by the ongoing processes of growth and structural adjustment. However, the results are not directly comparable with the majority of studies that consider the Uruguay Round liberalization in the benchmark economy (e.g., Francois *et al.*, 1995; Harrison *et al.*, 1995). To allow comparison with other model results, we need to know how important a difference is made if the model database is updated to the final year of the implementation process. The purpose of this paper is to assess how the changing world economy will affect the results of our analysis of the Uruguay Round.

Likely changes in the world economy over the implementation period of the Uruguay Round (1995-2005) include: higher growth rates in many developing economies relative to the mature industrial economics, increases in openness due to present and past trade liberalization as

well as increased demand for variety, changes in the structure of output and consumption in all economies, and changes in the rates of protection provided by non-tariff barriers. It is therefore instructive to consider the impact each of these might have.

Differential growth rates between developed and developing countries will change the average rate of protection applying worldwide. This is because, despite recent reductions, developing countries tend to have higher rates of protection than those applying in industrial countries. An increase in the share of developing countries in global GDP will, *ceteris paribus*, increase the average rate of protection worldwide. The increases in openness that are inherent in the process of globalization increase the importance of any given tariff rate simply by increasing the share of GDP affected by this distortion.

Changes in comparative advantage and consequent changes in the location of production may also have implications for the restrictiveness of overall trade distortions. Increases in the share of trade in products for which high tariffs apply will raise average rates of protection in the region, thereby raising the cost of protection. Correspondingly, increased trade in commodities covered by low rates of protection will tend to reduce average rates of protection. Product composition, as well as the relative size of each region will affect the gains from liberalization.

Where protection is provided by nontariff barriers, changes in comparative advantage will have implications through the *rate* of protection provided by any given set of trade barriers. Since shifts in comparative advantage can be quite rapid, as evidenced by the move in the past two decades towards sourcing textiles, clothing and toys from developing countries, concomitant adjustments to the tariff equivalents of protection can be quite sharp. This is especially important where quotas are on a bilateral basis and do not allow for the rapid changes in comparative advantage between countries. In this situation, it can be critically important to consider liberalization relative to the rates of protection applying in the year of implementation, rather than in the historical benchmark year used in the model.

In order to investigate the relative importance of the starting point for such analyses of the Uruguay Round, this paper reports results from two sets of simulation experiments. The first set of simulations are performed using the benchmark structure of the world economy in the pre-Uruguay Round period. These will be referred to as the "static" simulations, or alternatively the

simulations "without projections". They are representative of the majority of AGE-based analyses of the Uruguay Round. Our alternative simulations are performed by projecting the structure of the economy forward to 2005, and then implementing the Uruguay Round liberalization from that benchmark equilibrium.

The paper proceeds as follows. In the next section, we discuss the methodology behind the 2005 projections. This is followed by a discussion of these projections and their implications for the structure of the world economy. We then turn to a discussion of the experimental design used in this study. This is followed by a synopsis of the Uruguay Round liberalization experiment and our subsequent findings.

2. Methodology

To project what the world economy might look like in the year 2005, we simulate the GTAP model (Hertel and Tsigas, 1996) by shocking a relatively small number of fundamental determinants of output. The GTAP model is a relatively standard, multiregion, applied general equilibrium model, which assumes perfectly competitive markets and constant returns to scale technology. Unlike most such models, GTAP utilizes a sophisticated representation of consumer demands which allows for differences in the income responsiveness of demand in different regions depending upon both the level of development of the region and the particular consumption patterns observed in that region[1]. We follow Gehlhar (1994) in augmenting the usual production technology with human capital, which is treated as a complementary input to physical capital in the production function.

In the simulations presented in this paper we utilize exogenous projections of each region's endowment of physical capital, human capital, GDP, population and labor force. Since most trade distortions were taken to be constant *ad valorem* tariffs in the baseline simulations, no projections for these variables were required for the baseline (no Uruguay Round) simulations. However, since the Multi-Fibre Arrangement (MFA) operates through export quotas, which are exogenously specified, rather than their *ad valorem* equivalents, projections for these quotas were

1. For a detailed documentation of the model, and a number of illustrative applications which demonstrate its properties, see Hertel (1996).

also required, and the associated implicit export taxes are permitted to adjust endogenously. Quotas are in these simulations modeled explicitly[2], allowing us to target specific volume quota levels, and to estimate the consequential changes in quota rents.

It is important to bear in mind that our analysis is not a true dynamic analysis. Endowments are shocked exogenously and not subject to influence by relative price changes induced by the Uruguay Round reforms. This is also the case with the shocks to total regional factor productivity (TFP) which are derived as the difference between GDP growth and factor accumulation in an initial simulation run, and treated as exogenous in the policy simulations. We find this approach attractive due to its relative simplicity and ease of interpretation. However, it is likely to lead to an underestimate of the gains from policy reform, if reductions in protection stimulate additional investment and spur technological progress.

Given projections of the exogenous variables, the model can be solved for the level and structure of output at the end of the Uruguay Round implementation period. In the course of this simulation to the year 2005, the model maintains all of the restrictions imposed by economic theory. Thus, the changes in consumer demands are constrained to add up to changes in total spending; each group's income is determined by spending on its output; each region's total exports equals total imports of these goods less shipping costs.

The key factors driving structural change in the model are differences in the income elasticities of demand for different goods (Engel effects), and supply-side effects stemming from differential rates of factor accumulation interacting with differences in sectoral factor intensities. The latter are Rybczynski effects which can be important determinants of structural change (Krueger 1977; Leamer 1987; Martin and Warr, 1993).

The ability of any model to generate satisfactory projections depends upon its ability to capture the key linkages between variables of interest. The ability of the GTAP model to perform projections of this type has been validated through a backcasting exercise designed to see whether the model could explain the differences in East Asian trade patterns between the model's base year (1992) and those observed a decade earlier (Gehlhar, 1994). Using only information on

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[2]The specific approach used to introduce these quotas into GTAP is described in detail by Pearson and Bach (1996).

the differences in factor endowments between the 1992 and 1982, Gehlhar was able to provide reasonably accurate projections of trade shares in 1982. However, Gehlhar found that introducing a human capital factor was crucial to explain changes in trade shares, implying a need to add this factor to the standard model before using it for projections. This is in line with a number of growth regressions, where human capital is found to be a critical determinant of economic growth (e.g. Barro and Lee, 1993; Barro and Sala-i-Martin, 1995; Levine and Renelt, 1992).

For the analysis on long term changes in trade patterns, such as these projections, Gehlhar also found that the results were improved with increases in the Armington elasticities of substitution. Because of the results of this model validation exercise, *elasticities of substitution twice as high as the standard GTAP elasticities were therefore used in the projection experiment reported in this paper.* In the liberalization experiments the standard elasticities were used.

3. Base Case Projections

The projected values of exogenous variables used in generating the baseline simulations are presented in table 1 (see Hertel *et al.*, 1995 for more details). These were based on combinations of historical data and projections of the growth in population, in the labor force, in real GDP and in investment obtained from World Bank sources. Capital stock projections were generated by adding investment in each year and subtracting depreciation using the methodology of Nehru and Dhareshwar (1994). The human capital projections were based simply on the growth in the stock of tertiary education in each country during the 1980-87 period (Nehru, Swanson and Dubey 1994). The stock of agricultural land was held constant throughout the analysis. Finally, the rates of sector and factor neutral total factor productivity (TFP) growth rates for each of the 15 regions are obtained as the residual from a simulation with exogenous GDP growth and factor accumulation. The TFP growth rates are constant across all non-agricultural sectors within a region, while the TFP growth rates in the agricultural sector in all regions were set to 0.7 percent/year above the average rate for the economy as a whole (Gehlhar *et al.*, 1994).

From the cumulative growth projections in table 1, it is clear that there are substantial differences between the developed and the developing countries in their rates of factor accumulation. While population growth rates are sharply higher in all of the developing country

regions than in the developed regions, these rates are often dwarfed by the accumulation of physical and human capital. Growth in the capital/labor ratios presented in column (4) of table 1 show very rapid capital deepening in the high performing East Asian economies such as Taiwan and Thailand.

Table 2 reports shares of each region in global GDP and global trade, in the base year (1992) and in the projected 2005 equilibrium data set. There is a marked shift in the center of gravity towards East and South Asia over this period. For example, the Asian economies (excluding Japan) increase their share of global exports from 18 to 26 percent, more than both North America and European Union, who see their shares of both global exports and GDP slowly being eroded. The increases in both GDP and trade shares appear in all Asian economies, with China as the outstanding frontrunner. Latin America and Sub-Saharan Africa see small increases in their trade shares and a modest growth in their share of GDP.

Table 3 reports information on bilateral trade patterns for seven aggregated regions in the data base, in each of the two equilibria. The share of each region's exports to Asia increases significantly over this period. For example, the share of Japan's (JPN) total exports destined for other Asia (ASI) increase from 30% in 1992, to 42% in the projected 2005 data base. The share of intra-regional trade in Asia, relative to total exports from that region also increases, rising from 28% to almost 34%. The last column in table 3 reports the percentage increase in exports from each of the regions over this 13 year period. This amounts to 42.7% for USC, 35.6% for the EU and 127.6% for ASI. Clearly the importance of this region in the global trading picture changes significantly over the period. This will have an impact on the distribution of gains from the Uruguay Round, as viewed from the 2005 benchmark.

The ten aggregated sectors employed for this analysis, and their relationship to the 37 sectors available in the GTAP database are given in Table 4. To analyze the impact of MFA liberalization, it is essential to consider separately the impact of changes in economic structure on the output of the textiles and clothing sectors. Other sectors have been aggregated into a manageable number of groups, with manufacturing sectors grouped according to their factor intensities.

Table 5 reports projected changes in the composition of value-added at constant prices under the base line projections scenario (experiment P0). With the exception of Sub-Saharan Africa, the food and agricultural sectors decline in relative importance, worldwide. The decline in the relative importance of food production is a reflection of the relatively lower income elasticities of demand for these products, which tend to further decline with increasing per capita incomes. Further, the fixed endowment of land will tend to undermine the relative importance of agriculture as other factor endowments expand. This effect is particularly rapid in the high performing Asian economies where high rates of capital accumulation tend to "pull" labor out of the agricultural sector into other sectors (Martin and Warr 1993; Gehlhar, Hertel and Martin 1994).

Production of wearing apparel declines in relative importance in the industrialized economies, including Hong Kong, Korea and Taiwan. Meanwhile, these industries are projected to assume increased relative importance in the ASEAN countries. The USC and EU economies expand the relative size of their machinery and transport products sectors, but this expansion is even stronger in some of the East Asian economies. With a few exceptions, the services sector expands worldwide.

4. Experimental Design

A total of seven experiments were performed. One was the base projections from 1992 to 2005, and the other six are pairwise liberalization experiments from either base. The base case projection, designed to provide us with a 2005 starting point for the liberalization experiment, is labeled P0. In this experiment TFP growth was specified as endogenous in order to hit the real GDP growth rates specified in the macroeconomic forecasts from the World Bank; in the subsequent policy experiments, TFP growth was exogenous. Experiments S1 and P1 involve implementation of the Uruguay Round tariff cuts discussed in the next section. The important thing about this pair of experiments is that the percentage shocks are the same in both cases. That is because the *ad valorem* tariffs are held constant in the base case projection (P0). The same is true of the behavioral parameters in the model. Thus the only source of potential differences in

results arise from differences in the starting points, S1 from the 1992 data base, and P1 from the 2005 data base.

In the second pair of liberalization experiments, S2 and P2, the Multifiber Arrangement (MFA) is abolished. In this case, both the data and the policy shocks are different. The difference in the policy shocks arises because the MFA is a non-tariff barrier, the restrictiveness of which depends on the size of the quota and supply and demand conditions in the relevant markets. In the base case projection, we explicitly introduce the MFA quota growth rates over the 1992-2005 period (see below). This, combined with differential factor and income growth by region, results in significant changes in the *ad valorem* equivalent value of the MFA distortion.

The final pair of experiments, S3 and P3, simply serve to combine the tariff and MFA simulations in order to obtain a more complete estimate of the impact of the Uruguay Round. We now turn to a discussion of the details of these experiments.

5. Characterization of the Uruguay Round

Estimates of the pattern and extent of liberalization achieved as a result of the Uruguay Round are provided elsewhere (e.g.., see the papers from the recent World Bank conference on this subject). Our purpose in this section is to summarize the reductions in protection used in the model simulations presented in this paper.

The Multifiber Arrangement: Within this context, the most interesting form of protection addressed by the Round is the restrictions on trade in textiles and wearing apparel under the Multifiber Arrangement (MFA). Since exporters from developing countries must either purchase a scarce export quota before making an export shipment, or pass up the opportunity to sell (or otherwise transfer) a valuable quota received from the government, the effect of these quotas is analogous to an export tax levied by the government in the country of origin. The protective effects of these bilateral quotas can therefore be summarized using export tax equivalents which

differ by country of origin and destination[3]. Since the MFA restricts bilateral trade flows, the quota rents on each flow change in response to shifts in comparative advantage.

The effective export tax equivalents of MFA quotas imposed by the major importing regions against textile and clothing imports from each of the supplying regions used in the analysis are presented in Table 6, under the column headed "1992". The first point to note is that these bilateral quotas are generally more severely binding in the case of wearing apparel, resulting in larger export tax equivalents. Of the countries disaggregated in table 6, Indonesia faces the highest export taxes, with rates of 46% and 48% on wearing apparel exports to North America and Europe. It is followed by China and South Asia with rates of 40% and 36% to the restricted markets. Korea, Taiwan and Hong Kong face relatively lower export taxes for wearing apparel, reflecting the shift in their comparative advantage away from production of these products.

Table 6 also reports the share of total exports of each commodity aggregate to the MFA restricted markets. This share is an important indicator of the competitiveness of a particular supplier relative to its quota allocation. Countries with a small quota allocation relative to their production potential are forced to divert a large share of their exports onto unrestricted markets. Yang, Martin and Yanagishima (1994) show that this share is an important determinant of whether an exporter will gain or lose from abolition of the MFA.

The base growth rates of MFA quotas were determined through bilateral negotiations. While the original objective of the MFA was to allow a growth rate of at least six percent per year in quotas for textiles and clothing (GATT, 1973, Annex B, para. 2), subsequent renegotiations have allowed the growth rates for some suppliers to be reduced to zero. The base growth rates applying under the final MFA are presented in Table 7. They are reported on a *cumulative basis* over the period to be simulated in our subsequent projections experiments, namely 1992 - 2005. These rates are generally higher for the US and Canada than they are for the European market. Taiwan's MFA cumulative growth rate is smallest (only 6% for wearing

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3. This specification assumes that all of the rents generated by these quotas accrue to the exporter. If these rents are shared between the exporting and the importing region, as is suggested by Krishna, Erzan and Tan (1994) and Bannister (1994), then a rent-sharing parameter must be introduced to distribute the rents between the importer and the exporter.

apparel into the US and Canada). This is followed by Korea and Hong Kong. The ASEAN countries have the highest growth rates over this period. For example, Indonesia's cumulative quota growth rate to the US and Canada is 113% for textiles and 114% for clothing.

Returning to table 6, the column headed "2005" reports the projected tax equivalents associated with the data base in that year. These represent the combined effect of economywide growth and structural change, on the one hand, and the MFA quota growth rates from table 7 on the other. A comparison of the entries for 1992 and 2005 clearly shows that the quotas are projected to become more binding in all but a few circumstances, including USC imports from Latin America and ROW where the export tax equivalents decline. In some cases the increase in the tax equivalent is quite substantial. This is particularly true for exports of wearing apparel from China, Indonesia, Malaysia and the Philippines. Meanwhile, the share of exports from these markets to the restricted North American and European markets also declines over this period. This is a logical consequence of the binding quotas and more rapid income and population growth in other parts of the world. Quite simply put, the global market for textiles and wearing apparel has shifted away from the traditional importers and towards the Asian countries. One of the goals in this paper is to evaluate the consequences of these changes in the MFA for an analysis of its elimination.

Non-MFA Reforms: Table 8 reports information relevant to the non-MFA portion of the Uruguay Round Agreement. This includes weighted averages for the pre-Round and post-Round tariffs as well as trade-weighted average price cuts (change in tariff/one plus the initial tariff) for manufactures imports, by the regions used in the analysis. The trade-weighted average protection rates for manufactures were calculated using disaggregated tariff and trade data obtained from the WTO's Integrated Data Base. The pre-UR estimates are either the bound tariff rate, in cases where the tariff was bound at the beginning of the Uruguay Round, or the tariff rate applied in September 1986 if the tariff rate was not previously bound. In most developed countries, the pre-Round, bound tariff rate was the same as the applied rate for the vast majority of commodities, and so the rate reported is *both* the bound and the applied rate. In developing countries, by contrast, only around a fifth of industrial products were subject to bound tariffs prior to the Round (GATT, 1994a), and so the average tariffs reported in the first column of table 8 are more typically based on applied rates. Comparable data for food imports are also reported (see

Hathaway and Ingco (1995) and Ingco (1995) for more details on the food protection estimates). Because of the wide year-to-year variability of these tariff equivalents, the pre-UR tariff equivalents of agricultural protection are based on estimates of the average rate applying over the period 1979-1993 in OECD countries and 1982-1992 in other countries (Ingco 1995).

The pre-Round tariffs on non-food manufactures are quite low for the OECD countries, ranging from an average of 4.3% in the US and Canada, to 6.5% in Europe. However, they are considerably higher in East Asia (outside of Japan). Korea's average manufacturing tariff prior to the Round was 16%. The comparable figures in the Philippines and Thailand were 24% and 36%, respectively. The highest rate of manufacturing protection in the pre-Round column is 52%, associated with imports into the South Asia region. Note that data for Taiwan, Hong Kong and China were not available from the WTO's Integrated Data Base.

The estimates of post-Round tariffs in Table 8 are calculated using the rule that the rate of protection is reduced when the final, bound tariff is less than the pre-Round tariff rate. This approach overlooks reductions in average protection rates brought about by the introduction of bindings above current rates, but overstates the marginal reduction in protection brought about by a binding which reduces protection below its historical average levels (Martin and Francois, 1994). This simple approach also rules out estimation of the welfare gains obtained from reducing the variability of protection (Francois and Martin 1995). Since bindings without tariff reductions covered only 3 percent of imports of industrial goods into developed countries (GATT 1994), this omission is unlikely to be important for these countries. In developing countries, by contrast, bindings without tariff reductions covered 28 percent of total imports of industrial goods, and this omission may be somewhat more serious. Where these bindings have been set well above currently applied rates their liberalizing effects are limited and the omission will not be serious.

Comparison of the pre-Round manufacturing rates in column one to the post-Round rates in column two shows that the largest absolute cuts in tariffs are in Korea, Thailand and South Asia. The *proportional* cut is large in the OECD countries, e.g., Japan's post-Round average tariff on non-food manufactures is less than half of the pre-Round average. However, since the initial level of protection is lower in these economies, the effective price reduction on imported goods is not significantly larger than that for the other regions in table 8. The largest average

price cuts on imports are in Korea (6.8%), Thailand (6.3%), and South Asia (9.4%). The average price cut on imports to Latin America was only 1.6 percent, despite the huge reductions in applied rates of protection which have occurred in that region[4]. The reduction in import prices required in Sub-Saharan Africa is even smaller, at 0.1 percent, implying that commitments made under the Uruguay Round will impose very little discipline on manufactured goods protection in this region.

The figures reported for food import barriers in table 8 are aggregated from the estimates prepared by Ingco (1995) using average historical protection rates derived from OECD and USDA to represent the trade distortions which would have prevailed in the absence of the Round, and country schedule data to represent post-Uruguay Round rates of protection. In this data set, the rate of protection applied is taken to have been reduced only when the post-Uruguay Round rate of protection is below the historical average rate of protection. Once again, this means that the estimates neglect the liberalizing effects of tariff bindings introduced without any reduction in the applied tariff rates.

By comparison with the manufacturing cuts, the reductions in protection of food and agriculture listed in table 8 are much more varied. Average price cuts are negligible in North America, Europe and much of the developing world. Yet they are deeper than manufacturing price cuts in much of East Asia, where initial levels of protection are quite high. South Asia is shown to subsidize food imports on average, and the extent of this subsidy is increased slightly under the Round because of reductions in protection on some commodities with positive protection.

The tariff reduction experiments, S1 and P1, implement the cuts summarized in table 8, as well as 36% cuts in agricultural export subsidies. We do not shock output subsidies in agriculture. While modest reductions in these producer subsidies have been specified under the Round, they are given with respect to a base period where support was extremely high. Consequently, it is unlikely that these cuts will have a substantial impact on world prices (Hathaway and Ingco, 1995).

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4. Dean, Desai and Riedel (1994) report a reduction in the average applied rate in this region from 44 to 15 percent, implying a reduction in import prices of 20 percent.

One simple approach to measure the benefits of trade liberalization is to aggregate the tariff cuts by using the value of the imports to which they apply. While very rough as an indicator of the value of the tariff cuts, it does at least make some crude adjustment for the importance of particular trade flows. Furthermore, this calculation has significant potential implications for policy because it is widely used by trade negotiators interested in making a rough estimate of the benefits of offers by their trading partners. Information on the value of the cuts in most-favored-nation protection to agriculture and manufactures agreed under the Round is given in Table 9.

The table contains the value of protection cuts in the 1992 benchmark year, and in the projected 2005 equilibrium. The value of the cuts (in 1992 dollars) offered by each region is displayed in the far right column, while the entries in the body of table 9 show the percentage of the total cuts accruing to each exporter received from each importing region. The last two rows of the table show the share of the global value of cuts provided by each importing region.

The last two rows of the table highlight the rapid increase in the importance of the developing countries and the NICs between 1992 and 2005. The share of ASEAN in the total value of cuts is projected to increase from 11 to 17 percent over this period, while the NICs tariff cuts (all of which were offered by Korea) rise from 14 to 17 percent. By contrast, the share of each of the major developed country blocs declines, with Japan's share falling from 25 to 21 percent. The increase in the importance of the developing countries would have been even sharper if China and Taiwan had been included in the agreement.

The importance of cuts by particular suppliers, and the changes in their relative importance, differs considerably across suppliers. For exports from the USC, 65 percent of the value of cuts is provided by Japan and the NICs when 1992 trade weights are used. With the 2005 trade pattern, the share of Japan's cuts is projected to decline, while those of the NICs rise dramatically, from 18.2 to 24.2 percent. The tariff cuts offered by developing countries also become more important for EU exports. In this case (the second row in table 9), the shares of the total value of cuts given to the EU by USC, Japan and ROW all fall, while the tariff cuts offered by the NICs, ASEAN and Latin America become more important. For developing country exports as well, the general tendency is that the importance of the tariff cuts offered by the

developed countries will decline while those offered by the dynamic developing regions will become more important.

6. Welfare Effects Compared

We begin by examining the welfare effects of the various experiments outlined in section 4. These welfare results are reported in table 10. The upper panel in this table reports the percentage change in utility of the representative household associated with each of the regions in the wake of the two sets of liberalization experiments. (Even though the level of income is higher in 2005, we would expect a comparable percentage change due to the reforms, if the choice of base year were not important.) Comparison of the tariffs columns for 1992 and 2005 in this first panel (experiments S1 and P1) reveals percent changes in welfare which are quite similar between the two simulations. The largest proportional differences are for the EU, Thailand and Sub-Saharan Africa. For most regions the relative discrepancy is quite small.

Worldwide, the percentage change in welfare from tariff elimination is 17% higher in 2005, relative to the gain in 1992 (0.21% compared with 0.18%). This is a direct consequence of the shift in geographic importance towards the Asia region where the tariff cuts are more substantial. For example, the deepest cuts in protection reported in table 9 are for Korea, Malaysia, Philippines, Thailand, and South Asia. Whereas these countries only accounted for about 7% of global trade in 1992, this share is projected to rise to more than 10% by 2005 (table 2). Consequently their cuts in protection will become more valuable, when viewed in the context of the projections approach. This was evidenced in the higher share in global cuts accounted for by ASEAN and the Asian NICs in table 10.

This result is further examined in table 11. For both 1992 and 2005, we run 15 simulations whereby each country/region undertakes unilateral liberalization one-at-a-time. The summary welfare results in the table are the change in *global* equivalent variation stemming from this *unilateral* action on the part of a single country. The percentage of the global welfare gain deriving from the unilateral cuts in the EU, USC and Japan falls when moving to the year 2005, while the share of all Asian economies increases. Most notable are the increases in global welfare contributed by Malaysia (from 8.4% in 1992 to 12.3% in 2005) and Thailand (from 4.9% to 7.4%).

The second set of columns in table 10 refer to the percentage change in regional welfare owing to elimination of the MFA in 1992 and 2005. Here, the differences are much more striking than those in the tariffs column. The proportional gains to USC and EU from eliminating the MFA are nearly twice as high in 2005, at which time we project the quota rents to have increased significantly. This is mirrored in smaller proportional gains for some of the major MFA exporters, such as Indonesia, which now lose more in forgone rents when the MFA is abolished. In the case of the Philippines, this actually leads to a sign reversal, with the loss in rents dominating the increase in world prices for wearing apparel exports from that region. With larger distortions, it is hardly surprising that the welfare gains from liberalization are also larger in 2005. Table 10 indicates that the proportionate gain, worldwide is more than 60% higher in 2005, as opposed to abolishing the MFA in 1992.

The bottom panel in table 10 reports the welfare gains in a different format. Here, the global gain (reported at the bottom of this panel in billions of 1992 US$), is shared out across regions. For example, the first entry in this part of table 10 indicates that only 0.84% of the global gain of $36,408 billion stemming from 1992-based tariff cuts under the Round accrues to the USC region. In contrast, more than one-third (37.98%) of the ensuing welfare gains accrue to Japan, which enjoys significant efficiency gains from cutting its high tariffs on food products. Japan also enjoys a terms of trade improvement from increased demand for its manufacturing exports in other regions. The bottom row of this table tells us that 67% of the global welfare gain of $54,495 billion (i.e., $36,408 billion) comes from the tariff cuts.

Comparing the second set of entries (from 2005) at the bottom of table 10 to the first set, we see that the global distribution of welfare gains from the tariff cuts does not change too dramatically between 1992 and 2005. However, some of the terms of trade improvement experienced by Japan as a result of manufacturing tariff cuts, shifts in favor of the NICs, ASEAN (except Thailand) and China. By the year 2005, these countries have become much more important exporters of manufactured goods, and therefore are in a position to benefit more significantly from these tariff cuts.

Turning to the MFA experiment, we see that the USC and EU regions, which experience efficiency gains as well as a transfer of quota rents, appropriate most of the welfare gains from reform of the MFA. Among the MFA exporters, China, Indonesia and South Asia experience the

largest absolute gains, while Latin America, ROW and the NICs incur significant losses. When we turn to the 2005 simulations, the relative importance of the MFA in the overall gains increases from 30% to 38%, with the USC and EU regions being particularly large beneficiaries, while the MFA exporters as a group experience no net gain in welfare as a result of abolishing the MFA. China, Indonesia and South Asia remain the big gainers, but among these three, China is much more dominant in the year 2005.

Table 12 provides a further decomposition of the difference between MFA reform in 1992 and in 2005. This is accomplished by performing the 2005 simulation in two stages. The first involves shocking the 2005 export tax equivalents back to their 1992 level. From table 6, it is clear that for most MFA-affected flows this involves a tax cut, since the quota rents have increased over the projections period. The second part of the experiment involves removing the 1992-level MFA distortions from the 2005 data base. By conducting the experiment in these two parts we are able to distinguish between those differences that arise due to changes in the level of protection between 1992 and 2005 (the first simulation), and those that are due to changes in the structure of the world economy (the second).

Comparing first of all the percentage change in global welfare, reported in the last line of table 12, we note that the difference in the 1992 result (.08%) and the 2005 outcome (.13%), is primarily due to the higher tax equivalents in 2005 (.04% welfare effect when removed). However, the structural changes also contribute positively to the welfare effect in 2005, as evidence by the fact that the cuts from 1992 levels to zero generate a .10% income gain in 2005, whereas this experiment only yielded a .08% gain in 1992. The EU, which becomes much more import dependent, due to the structural shift away from textiles and wearing apparel (table 5) is the most dramatic source of this difference. Whereas this region only accounts for 50% of the gains from MFA reform in 1992, it accounts for 65% of the tax-normalized gains in 2005.

The dominance of China in the 2005 MFA reform (11.8% of 1992 global gains vs. 18.5% in 2005) can also be better understood by reference to table 12. Here, we see that the bulk of China's gains in 2005 are coming from the higher export tax equivalents in that year. Indeed, China garners 50% of the gains from the experiment where MFA rates are reduced to 1992 levels in the year 2005. In contrast, China's gains from the remainder of the reforms (1992 levels to zero) are only 6% of the global total.

7. Implications for Sectoral Output

Finally, table 13 compares the impact on output of the Uruguay Round reforms from 2005 (P3) and 1992 (S3). It is immediately clear that the largest discrepancies between these two sets of estimates are for the textiles and wearing apparel sectors. This is hardly surprising in light of the increased export tax equivalents in the 2005 data base. However, the pattern of discrepancies between the two sets of estimates is not a simply monotonic transformation of the change in quota rents. For example, there is a very significant increase in quota rents from 1992-2005 for China, yet the production response in table 13 is little changed. In contrast, Indonesia's quota rents increase less markedly, yet their output response is stronger from the 2005 base. This is explained in part by the fact that Indonesia maintains its export share to the MFA markets (58% for wearing apparel), whereas the share of textile and wearing apparel exports to the restricted markets drops significantly in the case of China. (Textiles drops from 19 to 12% and wearing apparel falls from 33 to 20%.) (See table 6).

These strong differences in output responses in the textile and wearing apparel sectors are mirrored by changes of the opposite sign in the other sectors of these economies. This is simply a reflection of the fact that national factor endowments are fixed in the Uruguay Round experiments reported here. Therefore, the stronger output response in Indonesian textiles and wearing apparel comes at the expense of output in other activities and the decline in output in these sectors is underestimated by the 1992-based simulation. For example, whereas light manufacturing output declines by 5.4% from the 1992 base, it falls by 7% from the 2005 base, due to the stronger rate of increase in textiles and wearing apparel output in 2005.

8. Assessment of the Uruguay Round in a Changing World Economy

This paper has aimed to assess the relative importance of evaluating the Uruguay Round in the context of a changing world economy. Most applied general equilibrium analyses of the Round have asked the question: "What would be the effect on the world economy in the base year (e.g. 1992), had the full Uruguay Round been introduced in that year?" However, the Final Act of the Uruguay Round will be phased in over the period of a decade. Therefore, it becomes relevant to ask how the world economy might change over that entire period, and how this in

turn might affect the analysis. We believe that the right question to be asking is "What will be the effect of the Uruguay Round Agreement in 2005, the final year of its implementation?"

Of course no one can say for certain what the world will look like in the year 2005. Our projections are based on a minimum number of exogenous inputs and many aspects of the model structure generating the projections are open to criticism. However, the fact that the world economy will be different in 2005 is indisputable. Furthermore, the broad shift in the center of economic gravity towards the South and towards Asia is already underway and shows little sign of abating. Similarly, the pattern of comparative advantage is changing, and will likely continue to do so over this period, with East Asian economies gaining comparative advantage in the production of physical and human capital intensive products.

We find that these changes in the global economy do make a significant difference in our analysis of the Uruguay Round reforms. There are two reasons why this is so. First of all, with the global distribution of trade and production shifting towards Asia, the relatively deeper UR cuts in that region become more important, giving rise to a 17% increase in the proportionate welfare gain following implementation of the tariff cuts. A second reason why the 2005 base matters has to do with the non-tariff barriers treated by the UR, in particular, the MFA. Our projections show that in the absence of the Round, almost all of the bilateral quotas associated with the MFA would have become more binding. Thus the resulting distortion in the year 2005 is significantly larger in the absence of the Round, and the subsequent global gain from MFA reform is more than 60% larger.

In the case of the MFA, actual procedures for implementation are more complex than we have conveyed in this paper. In practice, one must also consider the impact of accelerated quota growth under the Agreement on Textiles and Clothing (ATC). We have done so in an earlier analysis of the Uruguay Round (Hertel *et al.*, 1995). (Adding this complexity renders our analysis non-comparable to other, non-projections work in this area.) However, even when the ATC is implemented over the projections period, quota rents rise for many of the bilateral flows. This is a consequence both of shifts in comparative advantage towards the supplying countries, and simultaneous cuts in tariffs on textiles and clothing.

In sum, we believe that the projections approach to analysis of gradual policy reforms such as the Uruguay Round has much to recommend it. Not only does it capture the interaction

between economic growth and changing comparative advantage on the one hand, and policy reform on the other, it also provides a valuable perspective on the changes likely to come about under the reforms. Finally, the projections approach used in this paper may be viewed as a logical extension of the growing econometric literature seeking to explain the determinants of economic growth through regression analysis. By offering a bridge between econometric evidence and CGE modeling, we hope that the two approaches can join forces to shed further light on the interaction between trade policy reforms and economic growth.

Table 1. Assumptions Used in the Projections: Cumulative Growth Rates Over the Period 1992-2005 (Percentage Changes)

Regions	*Population*[a] *(1)*	*Labor Force*[a] *(2)*	*Capital Stock*[a] *(3)*	*Human Capital*[a] *(4)*	*k/l (3)-(2)* *(5)*	*hk/l (4)-(2)* *(6)*	*Real GDP*[a] *(8)*
United States & Canada (USC)	10	13	43	67	30	54	41
EU-12	2	2	19	167	17	165	33
Japan (JPN)	4	-2	52	61	54	63	39
Korea (KOR)	12	12	115	258	103	246	127
Taiwan (TWN)	11	18	136	112	118	95	126
Hong Kong (HKG)	10	9	118	112	109	104	90
China (CHN)	18	16	216	78	199	62	203
Indonesia (IDN)	23	30	132	230	101	200	117
Malaysia (MYS)	32	41	131	299	90	258	166
Philippines (PHL)	25	40	51	71	10	31	75
Thailand (THA)	19	26	178	332	151	305	171
Latin America (LTN)	25	32	17	119	-15	86	59
Sub-Saharan Africa (SSA)	47	48	39	268	-9	220	64
South Asia (SAS)	26	36	144	74	109	39	93
Rest of World (ROW)	18	36	37	103	1	67	37

Sources:(see appendix for computational details)
[a] International Economic Analysis and Prospects Division, World Bank.
[b] GTAP model simulation.

Table 2. GDP Share and Share of Total Exports by Region

	GDP Share		*TRADE Share*	
	1992	***2005***	***1992***	***2005***
USC	28.2	27.4	21.7	20.2
EU	29.1	27.3	19.0	16.8
JPN	15.9	14.8	11.9	9.3
KOR	1.3	1.8	2.9	4.0
TWN	1.0	1.4	3.0	3.9
HKG	0.1	0.1	2.2	2.9
CHN	2.2	4.6	4.3	7.9
IDN	0.6	0.8	1.2	1.5
MYS	0.3	0.5	1.5	2.4
PHL	0.2	0.3	0.4	0.5
THA	0.5	0.8	1.2	1.9
LTN	5.3	5.6	5.8	6.2
SSA	0.7	0.8	1.3	1.5
SAS	1.4	1.9	1.2	1.5
ROW	13.1	11.9	22.3	19.5
TOTAL	100	100	100	100

Table 3. Export Composition by Destination, *fob* Prices

		USC %	*EU* %	*JPN* %	*ASI* %	*LTN* %	*SSA* %	*ROW* %	*Total Exports* %	*bn 1992 US$*	*% of Total*	*% Change*
USC	1992	26.3	23.6	12.0	12.4	12.1	0.6	12.9	100	701	22	
	2005	26.0	20.1	10.4	18.9	12.1	0.6	11.9	100	1001	20	42.7
EU	1992	18.9	0.0	7.0	11.1	6.0	3.8	53.1	100	613	19	
	2005	18.3	0.0	6.5	16.9	6.2	4.4	47.7	100	831	17	35.6
JPN	1992	29.1	19.3	0.0	30.2	4.4	1.0	16.0	100	385	12	
	2005	24.1	15.4	0.0	42.0	3.8	1.0	13.7	100	458	9	18.9
ASI*	1992	21.6	16.9	14.7	28.0	2.3	1.2	15.2	100	575	18	
	2005	19.6	14.9	13.4	33.7	2.3	1.2	14.8	100	1,308	26	127.6
LTN	1992	42.7	21.7	6.5	5.5	16.7	0.6	6.4	100	188	6	
	2005	40.1	22.3	6.1	7.7	16.1	0.6	7.1	100	308	6	64
SSA	1992	27.8	50.2	3.4	4.8	4.1	3.2	6.5	100	43	1	
	2005	21.8	54.1	3.0	7.9	3.2	3.2	6.8	100	72	1	67.5
ROW	1992	10.2	44.8	11.1	12.6	2.1	0.7	18.5	100	720	22	
	2005	9.4	42.9	9.9	17.7	2.0	0.8	17.4	100	966	20	34.2
Imports	1992	702	722	305	536	200	46	713		3,224		
bn 1992 US$	2005	1,009	988	450	1,163	292	75	967		4,944		53.3
Imports	1992	22	22	9	17	6	1	22			100	
% of total	2005	20	20	9	24	6	2	20			100	

* ASI includes KOR, TWN, HKG, CHN, IDN, MYS, PHL, and TWA

Table 4. Commodity Aggregation

Aggregate Groups	*Original GTAP Industries*
1. Primary Agriculture (PrimAgr)	Paddy Rice Wheat Grains, other than wheat & rice Non-Grain Crops Wool Other Livestock Products
2. Processed Food (ProcFood)	Fisheries Processed Rice Meat Products Milk Products Other Food Products Beverages & Tobacco
3. Natural Resource Based Industries (NatRes)	Forestry Coal Oil Gas Other Minerals Petroleum & Coal Products Non Metallic Minerals
4. Textiles (Textiles)	Textiles
5. Wearing Apparel (WearApp)	Wearing Apparel
6. Light Manufactures (LightMnfc)	Leather Industries Lumber & Products Pulp, Paper, etc. Fabricated Metal Products Other Manufacturing
7. Transportation, Machinery & Equipment (TM&Eq)	Transport Industries Machinery & Equipment
8. Heavy Manufactures (HeavyMnfc)	Chemicals, Rubber & Plastic Primary Ferrous Metals Nonferrous Metals
9. Utilities, Housing & Construction Services (UH&CSvces)	Electricity, Gas & Water Construction Ownership of Dwellings
10. Other Services (Svces)	Trade & Transport Other Services (Private) Other Services (Government)

Table 5. Changes in Composition of Value-Added (evaluated at 1992 prices), by Region and Sector, Base Case: 1992-2005

	Sectors									
Regions	***PAgr***	***PFood***	***NRes***	***Text***	***WApp***	***LMnfc***	***TMEq***	***HMnfc***	***UH&CS***	***Svces***
USC	-18	-20	2	-11	-19	-10	19	1	-1	0
EU	-22	-25	-9	-23	-45	-18	13	-14	-14	13
JPN	-9	-11	21	-16	-31	0	-9	3	7	1
KOR	-63	-35	7	-36	-60	20	-10	14	-12	21
TWN	-50	-32	17	48	-52	44	-37	62	11	-5
HKG	-35	91	36	64	-49	95	20	68	11	-12
CHN	-82	-9	43	47	23	82	34	113	31	4
IDN	-46	-6	-37	9	-2	40	30	61	13	35
MYS	-64	-10	-47	3	30	49	-34	-12	-14	62
PHL	-14	-1	4	0	13	-4	-42	4	-7	10
THA	-77	-23	-67	0	-4	47	-19	23	0	40
LTN	-15	-11	18	-6	-6	-7	-36	-8	-22	12
SSA	12	17	-21	11	47	-5	-51	-13	-13	7
SAS	-30	1	22	23	21	38	33	38	44	-4
ROW	-23	-13	-18	-13	-20	-5	-9	-9	-3	11

Table 6. Share of Total Exports Going to Restricted Markets and Export Tax Equivalents associated with the MFA: Percent of Market Prices in Exporting Region, 1992 and 2005.

	Textiles						*Wearing Apparel*					
MFA Exporter	*Shares*		*Taxes*				*Shares*		*Taxes*			
			USC		*EU*				*USC*		*EU*	
	1992	*2005*	*1992*	*2005*	*1992*	*2005*	*1992*	*2005*	*1992*	*2005*	*1992*	*2005*
KOR	15	*14*	10	*14*	10	*16*	58	*54*	23	*35*	19	*33*
TWN	12	*7*	8	*25*	12	*28*	83	*76*	19	*33*	22	*39*
HKG	7	*4*	7	*17*	8	*22*	81	*70*	17	*29*	16	*32*
CHN	19	*12*	19	*36*	27	*44*	33	*20*	40	*62*	36	*63*
IDN	25	*22*	13	*18*	17	*26*	58	*58*	46	*56*	48	*64*
MYS	21	*17*	10	*16*	12	*22*	47	*32*	37	*52*	32	*54*
PHL	50	*47*	9	*12*	10	*24*	84	*80*	33	*43*	28	*48*
THA	40	*32*	9	*16*	13	*25*	44	*33*	35	*48*	36	*53*
LTN	50	*58*	10	*5*	13	*12*	89	*93*	20	*19*	18	*21*
SAS	45	*42*	19	*24*	27	*36*	83	*80*	40	*51*	36	*53*
ROW	59	*66*	5	*0*	6	*6*	87	*94*	16	*15*	10	*15*

Sources: 1992 shares and export taxes from GTAP data base (Chyc et.al.). 2005 shares and export taxes from updated data base following experiment P0.

Table 7. Cumulative MFA Quota Growth Rates (%) Under the final MFA

	TEXTILES		*WEARING APPAREL*	
Exporters	***US/Canada***	***European Union***	***US/Canada***	***European Union***
KOR	70	60	10	33
TWN	34	46	6	33
HKG	48	14	15	19
CHI	50	69	60	53
IND	113	71	114	100
MYS	113	65	110	66
PHL	116	0	103	0
THA	108	51	106	99
LTN	111	62	100	67
SAS	118	89	121	89
ROW	115	54	87	39

Source: S.Bagchi, International Textiles and Clothing Bureau, Geneva, Personal Communication.

Table 8. Average Pre- and Post-Uruguay Round Protection Levels, by Importing Region

Importing Region	*Pre-Round[a] Tariff (%)*		*Post-Round[a] Tariff (%)*		*Average Import[b] Price Changes (%)*	
	Food	*Mnfcs*	*Food*	*Mnfcs*	*Food*	*Mnfcs*
US & Canada (USC)	11.7	4.3	11.0	2.8	-0.6	-1.4
European Union (EU)	26.5	6.5	26.0	3.9	-0.3	-2.4
Japan (JPN)	87.8	4.9	56.1	2.1	-8.1	-2.7
Korea (KOR)	99.5	16.1	41.1	8.2	-17.9	-6.8
Taiwan (TWN)	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]
Hong Kong(HKG)	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]
China (CHI)	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]	0.0[c]
Indonesia (IND)	21.9	14.2	15.5	13.5	-4.2	-0.6
Malaysia (MYS)	87.9	11.0	34.3	7.7	-14.9	-2.9
Philippines (PHL)	86.9	23.9	33.4	21.5	-15.3	-1.8
Thailand (THA)	59.8	36.2	34.5	27.6	-10.8	-5.9
Latin America (LTN)	2.3	17.1	1.5	14.9	-0.5	-1.6
Sub-Saharan Africa (SSA)	15.6	9.5	12.4	9.4	-1.7	-0.1
South Asia (SAS)	-3.5	51.9	-4.3	37.1	-0.7	-9.4
Rest of World (ROW)	15.7	10.6	14.1	9.1	-1.2	-1.3

[a] Source: Integrated Data Base, GATT

[b] Change in tariff rate divided by the power of the initial tariff rate. This is the average of the disaggregate price cuts, and therefore differs from the price cut computed from the average tariffs.

[c] Data for Taiwan, Hong Kong, and China were not available from the Integrated Data Base.

Table 9. Value of Bilateral Cuts in Protection for all Commodities

		Destinations, percentage of cuts to each source country/region										*TOTAL*
Source		***USC***	***EU***	***JPN***	***NICs***	***CHN***	***ASEAN***	***LTN***	***SSA***	***SAS***	***ROW***	***mn US$***
USC	1992	0.4	13.9	46.7	18.2	0.0	7.9	5.8	0.4	2.9	3.8	-18,829
	2005	0.3	12.9	36.7	24.2	0.0	11.7	5.8	0.3	4.4	3.6	-28,031
EU	1992	16.8	0.0	13.0	7.6	0.0	6.1	8.3	0.9	10.4	36.9	-12,470
	2005	15.6	0.0	8.4	10.8	0.0	10.9	8.8	0.7	14.2	30.7	-16,036
JPN	1992	21.8	17.6	0.0	21.1	0.0	17.1	6.0	0.0	9.2	7.2	-8,748
	2005	16.8	12.7	0.0	26.3	0.0	22.7	4.5	0.0	11.0	5.9	-11,728
NICs	1992	20.5	14.0	31.5	4.2	0.0	15.4	3.2	0.1	3.0	8.0	-6,421
	2005	17.1	12.3	27.9	5.0	0.0	21.7	3.2	0.1	3.9	8.7	-13,502
CHN	1992	15.3	7.9	22.4	30.8	0.0	14.5	0.3	0.0	1.0	7.8	-5,120
	2005	15.0	8.6	18.1	27.5	0.0	17.9	0.4	0.0	1.5	11.1	-15,758
ASEAN	1992	13.8	12.9	34.0	5.5	0.0	18.0	0.4	0.1	1.0	14.3	-3,270
	2005	13.0	11.5	29.7	6.6	0.0	21.6	0.8	0.1	1.1	15.6	-7,221
LTN	1992	34.7	13.6	26.9	5.0	0.0	3.8	8.6	0.2	2.1	5.1	-2,417
	2005	30.1	13.3	25.3	6.3	0.0	8.1	8.0	0.2	2.4	6.2	-3,571
SSA	1992	4.9	29.9	12.8	3.3	0.0	13.1	2.1	1.4	19.4	13.2	-163
	2005	3.0	28.6	8.4	3.4	0.0	23.2	1.3	1.2	13.7	17.2	-382
SAS	1992	14.5	18.4	6.9	4.9	0.0	36.1	0.9	0.1	4.5	13.6	-850
	2005	12.2	15.5	4.5	4.8	0.0	44.2	1.2	0.1	4.4	13.1	-2,204
ROW	1992	6.6	39.0	19.3	9.8	0.0	12.8	1.7	0.2	4.7	6.0	-14,059
	2005	6.3	36.4	14.4	11.4	0.0	18.9	1.6	0.1	5.5	5.3	-17,974
TOTAL	1992	-8,521	-11,903	-18,138	-9,798	0	-8,270	-3,345	-239	-3,697	-8,434	-72,346
mn US$	2005	-12,679	-16,403	-24,013	-19,490	0	-19,766	-4,715	-265	-6,879	-12,199	-116,408
TOTAL	1992	12	16	25	14	0	11	5	0	5	12	100
% of global	2005	11	14	21	17	0	17	4	0	6	10	100

Table 10. Welfare Effects

	Percentage Change in Utility					
	From 1992			*From 2005*		
	Tariffs	*MFA*	*Both*	*Tariffs*	*MFA*	*Both*
USC	0.01	0.17	0.20	0.00	0.28	0.31
EU	0.11	0.14	0.27	0.14	0.30	0.47
JPN	0.44	0.01	0.44	0.43	0.02	0.44
NICs	1.26	-0.70	0.59	1.21	-0.64	0.60
CHN	0.54	0.43	0.81	0.49	0.53	0.90
IDN	0.53	1.18	1.95	0.49	0.82	1.53
MYS	3.44	-0.10	3.22	3.39	-0.18	3.10
PHL	1.54	0.39	2.28	1.68	-0.08	1.83
THA	-0.09	0.38	0.54	-0.28	0.21	0.14
LTN	0.02	-0.07	-0.06	0.03	-0.19	-0.18
SSA	-0.21	-0.08	-0.32	-0.16	-0.22	-0.43
SAS	0.07	0.64	0.72	0.08	0.44	0.49
ROW	0.13	-0.12	-0.01	0.14	-0.27	-0.15
TOTAL	0.18	0.08	0.27	0.21	0.13	0.35

	Percentage of Total Welfare Gain					
	From 1992			*From 2005*		
	Tariffs	*MFA*	*Both*	*Tariffs*	*MFA*	*Both*
USC	0.84	60.12	20.77	0.25	58.41	24.65
EU	18.20	50.07	29.32	18.69	59.79	35.85
JPN	37.98	1.26	25.66	29.38	1.70	17.92
NICs	17.34	-21.62	5.39	20.22	-16.67	5.88
CHN	6.62	11.83	6.62	11.10	18.54	12.02
IDN	1.73	8.70	4.25	1.95	5.00	3.56
MYS	5.87	-0.40	3.67	8.26	-0.70	4.47
PHL	2.06	1.19	2.04	2.24	-0.17	1.45
THA	-0.25	2.36	0.98	-1.09	1.25	0.31
LTN	0.66	-4.68	-1.18	0.90	-8.31	-2.89
SSA	-0.87	-0.71	-0.86	-0.65	-1.40	-1.04
SAS	0.61	11.90	3.95	0.78	6.45	2.76
ROW	9.20	-20.03	-0.61	7.97	-23.88	-4.92
	100	100	100	100	100	100
bn 1992 US$	36,408	16,177	54,495	60,352	38,876	102,128
Share of total, %*	67	30		59	38	

* Shares do not sum to 100% due to interaction effects.

Table 11. Global Welfare Effects from Unilateral Tariff Liberalization

	Global change in equivalent variation			
	From 1992		*From 2005*	
	US$ mn	*%*	*US$ mn*	*%*
USC	816	2.2	1,054	1.7
EU	4,947	13.6	7,907	13.0
JPN	14,145	38.8	18,635	30.7
NICs*	5,734	15.7	11,158	18.4
CHN	0	0.0	0	0.0
IDN	187	0.5	405	0.7
MYS	3,076	8.4	7,477	12.3
PHL	1,032	2.8	1,804	3.0
THA	1,788	4.9	4,467	7.4
LTN	1,044	2.9	1,422	2.3
SSA	-143	-0.4	-154	-0.3
SAS	1,748	4.8	3,441	5.7
ROW	2,100	5.8	3,069	5.1
TOTAL	36,473	100.0	60,685	100.0

Note: *Only South Korea undertakes tariff liberalization

Table 12. Decomposition of MFA liberalization in 2005, export tax shocks

	Change in equivalent variation						
	From 1992		*From 2005*				
			To 1992 tax level		*1992 level to 0*		*Total*
	US$ mn	*%*	*US$ mn*	*%*	*US$ mn*	*%*	*US$ mn*
USC	9,726	60.1	3,629	33.2	19,040	68.7	22,709
EU	8,100	50.1	5,075	46.4	18,132	65.4	23,245
JPN	204	1.3	-407	-3.7	1,068	3.9	660
NICs	-3,498	-21.6	1,462	13.4	-8,135	-29.4	-6,480
CHN	1,914	11.8	5,540	50.7	1,677	6.1	7,207
IDN	1,407	8.7	68	0.6	1,877	6.8	1,944
MYS	-64	-0.4	88	0.8	-360	-1.3	-271
PHL	192	1.2	99	0.9	-166	-0.6	-67
THA	382	2.4	325	3.0	160	0.6	484
LTN	-757	-4.7	-1,799	-16.5	-1,426	-5.1	-3,231
SSA	-115	-0.7	-288	-2.6	-256	-0.9	-545
SAS	1,926	11.9	772	7.1	1,743	6.3	2,506
ROW	-3,240	-20.0	-3,635	-33.3	-5,641	-20.4	-9,285
TOTAL	16,177	100.0	10,929	100.0	27,711	100.0	38,876
% of income	0.08		0.04		0.10		0.13

Table 13. Percentage Change in Output From Full Uruguay Round With and Without Projections

		Sectors									
Regions		***PAgr***	***PFood***	***NRes***	***Text***	***WApp***	***LMnfc***	***Tm&eq***	***HMnfc***	***Uh&cs***	***Svces***
USC	1992	2.8	0.7	0.4	-14.3	-45.0	0.1	1.0	0.2	0.2	0.2
	2005	2.8	1.1	0.2	-9.8	-29.4	-0.2	0.6	-0.1	0.1	0.1
EU	1992	-3.0	-0.9	0.4	-5.4	-47.6	0.2	1.0	0.2	0.4	0.4
	2005	-1.9	-0.7	0.4	-3.0	-22.2	0.3	0.2	0.4	0.3	0.3
JPN	1992	-6.9	-2.1	0.7	1.3	-2.5	0.7	-0.2	0.5	0.4	0.2
	2005	-7.2	-2.1	0.2	1.8	-1.6	0.6	0.3	0.3	0.3	0.2
KOR	1992	-8.7	4.4	-0.9	34.8	31.9	4.9	-3.3	1.4	1.2	-0.4
	2005	-8.8	3.3	-0.7	34.0	34.2	3.6	-2.4	0.6	1.0	-0.3
TWN	1992	1.2	4.9	-0.5	7.4	7.6	-1.0	-2.8	-1.1	0.5	-0.2
	2005	1.4	5.1	-0.3	3.3	2.3	-0.6	-1.3	-1.2	0.4	-0.3
HKG	1992	2.5	0.1	10.1	12.2	10.9	2.5	4.1	1.7	-1.5	-2.4
	2005	2.8	1.0	6.3	10.6	0.7	2.9	5.3	2.1	-1.4	-1.2
CHN	1992	1.4	-2.3	-2.2	6.5	35.0	-3.7	-5.3	-3.2	0.2	0.0
	2005	1.0	-2.1	-2.2	5.9	36.3	-4.1	-5.7	-3.2	0.1	-0.3
IDN	1992	-2.2	-1.2	-2.5	46.1	219.0	-5.4	-6.1	-4.1	1.1	-0.2
	2005	-2.5	-1.6	-3.1	53.3	253.3	-7.0	-7.3	-5.2	1.0	-0.2
MYS	1992	-12.2	27.6	-4.3	29.2	51.5	-1.9	-0.1	18.3	1.7	-1.3
	2005	-13.1	18.2	-3.5	31.0	65.9	-2.1	-0.3	15.0	1.5	-0.6
PHL	1992	-16.4	8.9	-1.9	49.9	117.0	-0.6	3.6	-1.8	0.9	-0.9
	2005	-18.0	6.3	-1.4	51.5	133.6	-0.9	3.0	-2.3	1.1	-0.3
THA	1992	-5.5	-2.1	-3.8	17.9	47.5	-1.4	1.3	-0.8	0.9	-1.1
	2005	-6.3	-3.2	-3.0	17.4	51.5	-3.3	2.1	-2.1	0.7	-0.8
LTN	1992	0.6	0.3	0.5	-3.6	-7.5	0.1	0.0	0.0	0.1	0.0
	2005	0.5	0.3	0.0	0.0	1.0	-0.3	-0.8	-0.5	0.1	0.0
SSA	1992	0.1	0.0	1.5	-9.1	-37.3	1.0	1.7	0.5	0.0	0.2
	2005	0.1	0.1	0.6	-4.4	-17.4	0.1	0.3	-0.1	0.0	0.1
SAS	1992	1.1	1.2	-3.4	12.5	59.5	-2.0	-10.3	-6.8	0.1	-0.2
	2005	0.9	1.3	-3.3	12.4	65.1	-2.3	-10.8	-8.4	0.0	-0.4
ROW	1992	1.4	-0.5	0.1	-9.7	-19.8	1.4	1.8	0.5	0.1	-0.1
	2005	1.4	0.4	0.0	-5.2	-10.3	0.6	0.9	0.0	0.1	-0.1

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