Brazil and the United States at the Gateway of the FTAA: A CGE Modeling Approach to Challenges and Options

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Introduction

As in previous periods of U.S.-Latin American history, the Brazil-U.S. economic relation once again looms large as to the evolution and outcome of a number of pending hemispheric negotiations and outstanding areas of global economic reform. As the first and second largest economies in the Western Hemisphere and the first and eight largest economies in the world, the relationship the U.S. and Brazil has repeatedly intrigued people of both countries and around the world for the scope of potential opportunities. With the launching of negotiations in September 1998 for an envisioned Free Trade Area of the Americas (FTAA), the future of the US-Brazil relation has emerged as the major question mark concerning the final form of a new Hemispheric order. With the US's largest trading partners (Canada and Mexico) now all joined within the North American Free Trade Area (NAFTA) and Brazil having formed MERCOSUR with its most important trading partners in South America, the US-Brazil bilateral trading relationship is for both countries, as well as the Hemisphere as a whole, the next largest trading relationship that is not yet subject to free trade rules.

At the same time that the Brazil-US relation sparks interest due to its potential opportunities, it also regularly generates a certain amount of apprehension in some quarters, in part precisely because of its potential for growth and impact. Within both the US and Brazil, questions are raised concerning the ability of each country to absorb the adjustments to a new trade agreement with a large partner of a very different income level, especially coming on the heals of major regional trade agreements like NAFTA and MERCOSUR. The specter of "many NAFTAs" is raised in the U.S. to caution

movement towards free trade with Brazil and an FTAA, while in Brazil some say that it may be better to liberalize with other regional partners as an alternative to free trade with the U.S.. Throughout the Hemisphere, questions are also raised as to what might be the relative impact of alternative sub-regional trading arrangements, both for the larger as well as smaller economies of the region. The essential questions that need clarification for all concerned is thus how would free trade between the US and Brazil compare with NAFTA and MERCOSUR experiences, on the one hand, and how would liberalization between the two largest economies affect the impact of the FTAA

This paper presents a computable general equilibrium (CGE) modeling framework for evaluating the potential benefits and challenges involved in the US-Brazil trade liberalization, both in a comparative context with NAFTA and MERCOSUR, as well as in a comparative context with an FTAA. The CGE modeling framework presented here includes the US and Brazil as well as all the other major Latin American countries and sub-regional trading groups. Four major scenarios are generated which allow for the exploration of the relative impacts of different free trade arrangements:

(1) NAFTA only;

(2) MERCOSUR only;

(3) NAFTA and MERCOSUR and a US-Brazil free trade; and

(4) FTAA.

The results of this analysis indicate that while Brazil-US trade is indeed the next largest relationship that can be liberalized, its impact both immediately and over time, is likely to be less than half of the impact of NAFTA and MERCOSUR for both the U.S. and Brazil, as well as for the Hemisphere as a whole. Brazil-US trade liberalization is

nevertheless the single largest next potential contributor to gains from trade within an FTAA. The results also indicate than the ultimate formation of full hemispheric FTAA is the superior option for both the U.S. and Brazil, as well as the Hemisphere as a whole.

The paper is organized as follows. The next section reviews the structure of economic relations and levels of protection for the U.S. and Brazil as well as within and between NAFTA and MERCOSUR, describing the base data used in our US-Brazil-FTAA CGE model. Section three discusses the US-Brazil-FTAA CGE modeling approach. Section four presents the model results for alternative scenarios of U.S.-Brazil trade liberalization, including NAFTA, MERCOSUR and the FTAA. Section five presents our conclusions.

2. Brazil-US and Hemispheric Structure of Trade, Production, and Protection

Analysis of the potential impact and implications of US-Brazil and Western Hemispheric free trade is shaped by the complex network of economic and political ties which already exist throughout the region. Each country is tied into others in the region to varying degrees, and the strength of this interdependence shapes the outlook and prospects for each.

Tables 1 and 2 present major economic indicators for countries and regional groupings in the hemisphere, including GDP and GDP per capita, Brazil-US and Hemispheric trade, and financial flows as a percentage of GDP. All data is for 1995 as well as for 1990, the base year of the BRAZIL-US-FTAA-CGE model. The hemispheric asymmetry is evident in the wide disparities in GDP and GDP per capita figures. The U.S. GDP, for example, is almost 11 times that of Brazil and 1,200 times that of Bolivia;

U.S. GDP per capita is seven times larger than Brazil and Mexico, and over 20 times higher than the Central American Common Market (CACM) average.[1]

Turning to hemispheric trade data, the larger economies are actually much less dependent on trade than are smaller ones. The apprehension towards freer trade in the larger countries may seem somewhat paradoxical since the largest economies, Brazil and the U.S., are the least open less open, with export shares of only around 7 percent of GDP in 1990 and around 9 percent in 1995. In comparison, Chile, Costa Rica, and Ecuador (among the smallest countries in the region) have export shares greater than 25 percent of GDP.

The U.S. and Brazil pose a particular set of "special cases" that set them apart from the rest of the Hemisphere, and indeed, the world. Among the largest 30 economies in the world, the U.S. is the least open among developed countries and Brazil is the least open among developing countries. While the U.S. is 8th and Brazil is 31th in per capita terms, they are 27th and 63th in exports per capita. In comparing 1990 with 1995, both the U.S. and Brazil have lagged considerably behind the Hemisphere in a generalized growing share of trade to GDP. Yet while the U.S. has been making more recent progress in successfully growing its export capacity, Brazil has not in comparison to other developing countries such as Mexico. While the US remains the world's largest exporter, Brazil is number 23 and falling.

The relative dependence on trade *within* the Hemisphere also varies substantially, with the Latin American countries much more dependent on trade with the U.S. than vice

[1] These gaps are significantly more than those which confronted Western Europe during the enlargement of the EC, yet are in the range of current disparities across Eastern and Western Europe, as well as within East Asia. See Hinojosa (1993) for a comparative discussion of regional inequalities within Europe, Asia, and the Americas.

versa. Traveling south in the hemisphere away from the U.S., this dependence declines, while trade among Latin American countries and with the rest of the world increases. For Mexico, exports to the U.S. in 1995 were much larger (22.4 percent of GDP) than exports to the entire Latin American community (only 1.3 percent).

Since the formation of MERCOSUR, Brazil has shifted dramatically towards much more trade with LAC . While as recently as 1990, Brazilian exports to the U.S. as a share of GDP were only 1.9 percent, this was more than double the level of trade with all of LAC combined. By 1995, Brazilian exports to LAC rose to over 2% of GDP while exports to the U.S. fell to 1.7%. For Argentina, exports to the U.S. as a share of GDP fell even more dramatically (from 1.8 to .8 percent), while exports to countries within Latin America community rose from 3.4 to 4.7 percent. While LAC economies are more dependent on U.S. trade than the U.S. is on LAC markets, U.S. trade with LAC countries as a share of GDP is greater than that in Mexico and has only recently been surpassed by Brazil.

The asymmetrical trade pattern in North and South America becomes more evident in Table 2, which list exports to different trading partners in 1990 and 1995 as a percentage of total exports. Latin American economies have historically depended primarily on countries within the Hemisphere as markets for their products, with the largest share going to the U.S. (shown here as part of NAFTA). NAFTA has actually become even more important as a destination of LAC exports, up from 39% to 46% from 1990 to 1995. While the U.S. exports are largely exported outside the Hemisphere, the importance of exports to LAC has risen from 12% to 17% in five years. The asymmetry in trade dependence between North and South is also diminishing in the 1990s compared

to the 1980s. Macro stability and sweeping economic reforms in Latin America have created rapid growth in import needs, and LAC is becoming the fastest growing market for U.S. exports. In the early 1990s, exports to Latin America accounted for one-third of the total increase in U.S. exports. However, this increase in U.S. exports to Latin America has also produced a corresponding rise in troublesome bilateral trade deficits with the U.S.

There is also evidence that regional trading blocs have shifted trade towards greater intra-bloc trade on a global scale. Trade within existing trading blocs (NAFTA, MERCOSUR, and the European Community) all increased over the last decade. Latin American exports to the U.S. and to Latin America now represent a larger percentage than they did in 1990, while the share of exports to Europe and Japan have fallen back below 1990 levels. The levels of intra-MERCOSUR and intra-Andean Pact trade more than doubled from 1990 to 1995. As trade blocs and agreements become more important in the emerging world economic order, fear of exclusion becomes another motivating factor in the policy shift in Latin America in favor of trade alliances.

Table 4 presents the average import tariff rates for the economies in the BRAZIL-US-FTAA model. In general Brazilian tariff barrier rates are significantly higher than U.S. tariff barriers. The distribution of protection is somewhat different between the two countries. The U.S. has relatively higher rates on agricultural products compared to manufactured products (expert for light manufacturing, which has the highest rate of any sector). In Brazil, on the other hand, manufactured goods are more protected, although tariff rates on agriculture products are still relatively higher than in the U.S. The dispersion between rates is also higher, with protection ranging from a low of 4 percent

on other agricultural products to 33 percent on consumer durable to a high of 50 percent on oil.

The impact of different trade liberalization scenarios will be influenced by this structure of protection, along with the pattern of sectoral productivity (Table 3) and trade (Table 5). Larger increases in trade flows will occur where liberalization is reducing tariffs the largest amount on the greatest volume of trade. The tariff structures shown in Table 4 suggest that the short-run export benefits of trade liberalization should accrue mostly to the U.S. Most Latin American exports are agricultural products and natural resources which do not face significant tariffs in the U.S. and where the U.S. does not have a strong comparative advantage. Only 18 percent of LAC exports encounter tariff rates of five percent or higher and only eight percent encounter these rates plus non-tariff barriers. However, the limited LAC manufacturing exports that currently occur are in sectors with relatively high comparative advantage but which also face higher U.S. tariff rates and non-tariff barriers.

3. Modeling Alternative Scenarios of U.S.-Brazil and Hemispheric Trade

3.1 The BRAZIL-US-FTAA-CGE Model

In this paper, Western Hemispheric regional integration is analyzed using a computable general equilibrium (CGE) model. The BRAZIL-US-FTAA CGE model is in the tradition of recent multi-country CGE models that analyze the impact of the Uruguay Round of GATT negotiations,[2] the impact of the North American Free Trade

[2] These models, in turn, have built on multi-country models developed to analyze the impact of the Tokyo Round of GATT negotiations X in particular, the multi-country CGE model developed by Whalley (1985). Our model starts from the WALRAS model developed at the OECD to analyze the impact of the current GATT negotiations on the major OECD countries detailed in

Agreement, and its potential expansion to include Central America and the Caribbean.[3]

The BRAZIL-US-FTAA CGE model developed in this article consists of an eleven-sector, eleven-country model that builds on the multi-regional CGE framework developed by Hinojosa-Ojeda, Lewis, and Robinson (1994, 1997). The model consists of ten sub-regional or "country" CGE models (Argentina, Brazil, Chile, Bolivia, Peru, Ecuador, Colombia, Venezuela, Mexico, and the U.S.) inter-connected through trade flows. Each "country" model follows closely what has become a standard theoretical specification for trade-focused CGE models.[4] In addition to eleven sectors, the model has six factors of production in each country: land, capital, rural labor, urban unskilled labor, skilled labor, and white-collar workers. For each sector, the model specifies output-supply and input-demand equations. As in our earlier models, there is a simple representation of the rest of the world (the eleventh region), which is modeled as a large supplier of imports to, and demander of exports from, each of the other economies at fixed world prices. The rest of the world is modeled as having an upward sloping export-supply curves and downward-sloping import-demand curves.

The BRAZIL-US-FTAA-CGE regional model incorporates several innovations relative to earlier multi-country CGE trade model. First, import demand is modelled using an Almost Ideal Demand System (AIDS) specification, which (in contrast to the standard constant elasticity of substitution (CES) function), allows expenditure

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OECD (1990).

[3] See Hinojosa and Robinson (1992), Brown (1992), and Schoepfle (1993) for a review of NAFTA CGE models. See Hinojosa, Lewis, and Robinson (1994, 1997) for the GNAFTA and NASAFTA-CGE models.

[4] Robinson (1989) surveys CGE models applied to developing countries. Shoven and Whalley (1984) survey models of developed countries. The theoretical properties of this family of trade-

elasticities to be different than one.

Second, to capture the potential dynamic externality effects of trade liberalization, the BRAZIL-US-FTAA-CGE model can simulate the impact of positive externalities generated by both export expansion and capital good imports that embody "new" technology. The model incorporates three different kinds of trade-productivity links. The first relates sectoral productivity to sectoral imports of intermediate and capital goods the extent of productivity increase depends on the share of intermediates in production. Second is an externality linked to sectoral export performance higher export growth translates into increased domestic productivity. Finally, there is an externality associated with aggregate exports increased exports make physical capital more productive, an effect embodied in the capital stock input to the production process.

The externalities associated with imported intermediate input use (^{m}) and sectoral export performance (^{e}) affect productivity in the sectoral production functions [equation (1)], while the externality associated with aggregate exports (^{k}) is embodied as an increase in the initial capital stock ($FS_{k,0}$) [equation (2)] and therefore enters the production function indirectly as an increase in the capital input. $F_{i,f}$ are the sectoral factor inputs into the production process (including capital); X_i is sectoral output, and FS_k is the economywide aggregate capital stock (so FS_k = $_i$ $F_{i,k}$).

$$X_i = r_i^m \bullet r_i^e \bullet [\sum_f a^{i,f} F_{i,f}^{g^{i,f}}]^{\frac{1}{g^{i,f}}}$$

$$FS_{k,t} = FS_{k,0} \bullet r^k$$

The three externality relationships are shown in equations (3)-(5). *MTOT* and *ETOT* in equations (3) and (5) correspond to aggregate imports and exports for each

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focused CGE models are discussed in Devarajan, Lewis, and Robinson (1990).

region, E_i is sectoral exports, and n_i is the share of intermediate inputs in production. The subscripts *0* and *t* refer to the base period and experiment, respectively:

$$r_i^e = \left(\frac{E_{i,t}}{E_{i,0}}\right)^{\eta_e}$$

$$r_i^m = \left(\frac{MTOT_t}{MTOT_0}\right)^{\eta_m} \bullet n_i + (1 - n_i)$$

$$r^k = \left(\frac{ETOT_t}{ETOT_0}\right)^{\eta_k}$$

Each of the three effects operates through simple elasticity equation: for example, an export-productivity elasticity (^{e}) of 0.25 for industrial sector exports from developing regions means that a 10 percent rise in real exports would result in a 2.5 percent increase in total factor productivity in that sector. In general, the elasticities used for industrial regions (the U.S.) are less than half the values used for the developing regions.

While there is fairly widespread agreement that these feedbacks exist, there is less consensus on the channels through which they operate, and how large they are. For our purpose, we are more interested in showing how such linkages might affect analysis of the integration alternatives; thus, we have included three different linkages that operate through different channels. With little empirical estimation to draw on, the choice of externality parameters to use in the model is based largely on guesswork. We have chosen fairly modest parameters, to avoid overstating the case; for example, our sectoral export-productivity linkage effects for the developing Latin American regions are given an elasticity parameter around one-half that used by de Melo and Robinson (1992) in their analysis of the Korean growth performance.

Each "country" model traces the circular flow of income from producers, through factor payments, to households, government, and investors, and finally back to demand for goods in product markets. Producers are assumed to maximize profits and consumers

have price-sensitive expenditure functions. The country models are highly nonlinear, and solve for equilibrium wages, land and capital rental rates, commodity prices, and the real exchange rate. These solution prices achieve market-clearing equilibrium in factor markets, product markets, and the balance of trade. The country models are linked primarily through trade flows. The model specifies sectoral export-supply and import-demand functions for each country, and solves for a set of world prices that achieve equilibrium in world commodity markets.

In common with other CGE models, the model only determines relative prices and the absolute price level must be set exogenously. In the BRAZIL-US-FTAA-CGE model, the consumer price index in each country is set exogenously, thereby defining the numeraire in each economy. The advantage of this choice is that solution wages and incomes are in real terms. The solution exchange rates in the sub-regions are also in real terms, and can be seen as equilibrium price-level-deflated (PLD) exchange rates, using the country consumer price indices as deflators.[5]

The model data base consists of social accounting matrices (SAMs) for each country, including data on bilateral trade flows with the other countries.[6] The SAM starts from multi-sectoral input-output data, expanded to include information on the circular flow of income from producers to factors to institutions, which include households, enterprises, government, a capital account, and trade accounts for all the partner countries and the rest of the world. These institutions represent the economic actors whose behavior and interactions are described in the CGE model. The parameter estimates for

[5] De Melo and Robinson (1989) and Devarajan, Lewis, and Robinson (1991) discuss the role and interpretation of the exchange rate in this class of model.

[6] Social Accounting Matrices are described in Pyatt and Round (1985).

the sectoral production functions, consumer expenditure functions, import aggregation functions, and export transformation functions are drawn from a variety of sources. The various parameters used in the model represent point estimates for the base year (1990) and the model was benchmarked so that its base equilibrium solution replicates the base data.

3.2 Description of Scenarios

The scenarios presented in this paper evaluate the impact of alternative paths of trade liberalization among countries in North and South America. The scenario results portray the static general equilibrium and dynamic externality effects of changing the structure of trade protection in the hemisphere. By systematically altering only the trade policy variables, we can analyze the effects of different liberalization outcomes on trade within the region, trade with the rest of the world, and the structure of production and income distribution for each country in the hemisphere. For each scenario, we obtain estimates of the impact on real GDP, output, trade, value added, real wages of each labor category, and the real rental rates of capital and land. Trade diversion and trade creation impacts will be evaluated through data on total, intra-regional, and extra-regional trade.

These scenarios are not growth predictions; actual growth pattern will be affected by more factors than just trade policy, such as macroeconomic and incomes policies. Instead, the scenarios should be seen as controlled experiments within a simulation laboratory that isolates the impact of changes in specific policy variables, in this case, tariff and non-tariff barriers. Both the comparative static and dynamic externality experiments are meant to describe the impact of trade liberalization "in the medium to long run". The term "dynamics" is not used to describe the actual path of the transition,

but rather the cumulative effect over time of productivity externalities that might arise as a result of trade induced by regional integration, and that have been identified as important in earlier cases of export-led development.

The results of each scenario are presented relative to a base run calibrated with the pre-liberalization (late 1980s) structure of protection throughout the region. Each scenario was run both as a comparative static experiment, and as a "dynamic" experiment incorporating the possible impact of trade externalities.

In Scenarios 1 and 2, we analyze the impact of NAFTA and MERCOSUR as individual sub-regional accords. Scenario 1 presents the impact of NAFTA on the U.S. and Mexico, as well as on other countries in the region (without MERCOSUR). The experiment assumes the complete elimination of all tariff and non-tariff barriers between Mexico and the U.S., with protective barriers between other countries unchanged. Scenario 2 presents the impact of MERCOSUR on Brazil and the U.S., as well as on other countries in the Hemisphere and the rest of the world, assuming NAFTA did not occur.

The two remaining scenarios portray alternative liberalization paths that build on top of NAFTA and MERCOSUR. Scenario 4 examines the impact of free trade between the U.S. and Brazil in the presence of both NAFTA and MERCOSUR. Scenario 4 considers the potential of broader liberalization with the formation of a full Free Trade Area of the Americas (FTAA), involving elimination of all tariffs among hemispheric economies.

4. Scenario Results

The Impact of NAFTA

The NAFTA scenario (Scenario 1) replicates the results of virtually all previous studies by finding a small positive impact on participating countries' GDP.[7] While the static impact is quite small for all the NAFTA economies, GDP is larger for when the possibility of trade-related externalities is incorporated (Tables 6a and 6b).[1] Mexican GDP grows by 4.7% in the NAFTA externalities scenario. Our results also provide some corroboration to fears that sub-regional accords such as NAFTA could have a negative impact on Latin American countries that are left out. The formation of NAFTA is shown to have a slight negative impact on Brazil GDP and trade, although even the externality impacts are clearly very small in terms of real GDP (Table 10b).

This negative impact on NAFTA outsiders is the result of the increased concentration of trade between the NAFTA partners, and the corresponding diversion of imports and exports by the NAFTA members away from other Latin American countries. In the static case, NAFTA causes intra-regional (Western Hemisphere) exports for the U.S. and Mexico to increase by 5.3 and 4.9 percent respectively, while they decline for all other countries, including a -0.25 percent drop for Brazil (Table 7a). In the dynamic results, U.S. intra-regional exports increase by 10.23 percent although extra-regional exports grow hardly at all, suggesting a diversion in trade away from the rest of the world towards LAC markets (Table 7b). For Mexico, although the growth rate of total exports more than doubles when externalities are included, the marginal increase in intra-regional exports is small, implying that much of the additional expansion occurs to the rest of the

[7] See Hinojosa and Robinson (1992) and Hinojosa, et al. (1996) for a review of modeling of NAFTA.

world.

While the static results produce a decline in Brazilian and Argentine intra-regional exports, the externality results show a reversal to a increase in intra-regional exports as Mexico as well as the U.S. GDP expands. For Brazil and Argentina, the largest trade diversion impact is a drop in exports to Mexico in the static NAFTA scenario 1 (Table 8a), while this is reversed in the externality scenario 1 (Table 8b). The smaller decrease in Brazilian exports to the U.S., however, remains even with the NAFTA externality scenario. Brazilian export declines due to NAFTA are concentrated in food and agricultural sectors in the model (Table 10), driven by declining non-manufactured exports to the U.S. (Table 11). These small Brazilian GDP and export declines are also reflected in small falls in factor returns, particularly rural and urban unskilled labor.

Confirming findings from earlier studies, NAFTA can thus be shown to generally generate more trade creation than trade diversion. Total hemispheric exports grow by 0.34-0.71 percent, depending on whether externalities are incorporated (Table 6). While U.S. extra-regional exports do decline slightly, Mexico actually increases its exports outside the Hemisphere due to NAFTA, and overall there is much more Hemispheric trade created (around $2 billion in the static case) than there is trade diverted from the rest of the world (around $0.5 billion) (Table 7). With externality effects, the gap between trade creation and diversion widens even further: trade creation within the hemisphere reaches $3.3 billion, while the drop in exports outside the region is only around $0.2 billion, with the change driven by higher exports by Mexico to markets both

inside and outside the hemisphere.[8] (Table 8)

The Impact of MERCOSUR

In Scenario 2 we assume that NAFTA has not occurred, and instead simulate the impact of eliminating tariff barriers between Brazil and Argentina (MERCOSUR) and the imposition of a common external tariff on January 1, 1995.[9] The results in Table 6 indicate that MERCOSUR generates modest GDP improvements for Brazil and Argentina (0.1 and 0.11 percent) in the static case, but much more significant gains with externalities (4.5 percent for Brazil and 2.9 percent for Argentina,). The static gains in GDP from MERCOSUR for Brazil and Argentina are less than they are for Mexico with NAFTA. Brazil in particular, however, does exceptionally well in the externality scenario 2, almost matching Mexico's externality gains due to NAFTA (Table 6b), indicating the potential for export led productivity growth of the Brazilian economy. This growth in Brazilian GDP with MERCOSUR is reflected in a generalized and relatively large growth in factor returns, particularly in returns to rural labor and land (Tables 9a and 9b).

MERCOSUR does have a slight negative static impact on Mexico, but almost no impact on other Latin American countries not included in MERCOSUR (except for a gain for Bolivia). The impact on the U.S. is also negligible. Overall Hemispheric export expansion is positive (0.32-0.70 percent), about as great as that caused by NAFTA (Table

[8] This result is evidence that can help confirm the theoretical proposition that the dynamics effects of regional integration may outweigh their trade diversion impacts. See Chichilnisky (1992) and Gunter (1993).

[9] The data for the MERCOSUR common external tariff is as follows:

6). In the static case, Brazil experiences strong growth (2.93 percent), although not as high as Argentina (3.53 percent). With externalities, export growth in Brazil more than doubles, with most of the increment directed outside the region (Table 7b), while Argentina's export performance is not as great. In a sense, the MERCOSUR outcome parallels that of NAFTA, in that the one country (Argentina or the U.S.) has a much greater expansion in intra-regional exports, while the second (Brazil or Mexico) has export growth directed more towards markets outside the hemisphere and benefits the most from the possible trade externalities.

As with NAFTA, MERCOSUR generally generates much more trade creation than trade diversion. In fact, there is no aggregate trade diversion under MERCOSUR; overall, total exports to destinations outside the region increase slightly in both the static and dynamic cases, although the increase is not large. The static impact of MERCOSUR does produce a slight decline in U.S. exports to Brazil (-0.9% in Table 8a), but this is more than reversed in the externality scenario (+3.0% in Table 8b). The U.S> to Brazil trade diversion is concentrated in declining agricultural products (Table 11).

U.S.-Brazil Free Trade

Scenario 3 assumes that both NAFTA and MERCOSUR are already established and then simulates the elimination of all tariff barriers between Brazil and the U.S. The incremental impact of U.S.-Brazil free trade should be seen as the impact of scenario 3 net of the impacts of scenarios 1 and 2. Seen in this light, the additional GDP impact of U.S.-Brazil free trade for the U.S. is approximately .001 in the static scenario and .016 in the externality case (Table 6). The impact on Brazil is also small in the static case (.015),

but significantly higher in the externalities scenario (1.17 percent). For the U.S., the GDP impact of a scenario of free trade with Brazil would represent half of the static and three quarters of the externalities impact of the NAFTA scenarios. For Brazil, free trade with U.S. represents between one sixth (static) to one quarter (externalities) of the impact of MERCOSUR.

The relative impact of scenario 3 on U.S. exports is about the same as the impact of NAFTA in the externality case, and is thus slightly higher relative to the U.S. GDP impact of NAFTA (Table 6). The impact on Brazilian export growth of scenario 3 is almost half of the impact of MERCOSUR in the externality case, yet it is significantly higher than the relative GDP effect. Brazilian exports both to the U.S. and to other countries are thus stimulated at a higher rate due to trade liberalization with the U.S. proportionately to liberalization within MERCOSUR, both in the static and externality case. This seems to be driven by the ability of Brazil to significantly increase extra-regional exports, especially in the externality case, based in part through a rapid increase in intra-regional imports (Table 7b).

This export success can be traced to the sectoral composition of Brazilian imports from the U.S. relative to MERCOSUR. In scenario 3, the largest relative growth in U.S. exports to Brazil are in manufactured good, including growths of over 10% in capital and intermediate goods (Table11). Accompanying this increase in U.S. manufactured exports, U.S. exports in non-manufactured agricultural products remain flat expect for corn. Meanwhile, Brazilian extra regional exports in scenario 3 for manufactured goods (capital and intermediate) grow by over 20% as resources are shifted away from non-manufactured exports. At the same time that worldwide Brazilian exports are expected to

grow and become increasingly concentrated in manufactured goods (Table 10b), exports to the U.S. should expand in both manufactured and non-manufactured goods (Table 11).

The increases in GDP and exports of U.S.-Brazil trade liberalization are reflected in general increases in factor returns to both countries (Table 9). In Brazil, the growth in factor returns is both higher than in the U.S. and proportionately stronger than GDP growth, particularly for rural labor in the externality case. Benefits in the U.S. are more concentrated in incasing returns to capital, professionals and urban skilled workers, particularly compared to NAFTA that proportionately benefited land and rural labor more.

Free Trade Area of the Americas

In the fourth and final scenario, we supercede the three previous partial liberalization scenarios with a full elimination of tariffs among all the economies in the Western Hemisphere. Viewing all four scenarios allows us to see the contribution of each partial liberalization relative to the sum total impact represented in scenario 4.

As noted previously, NAFTA and MERCOSUR have roughly similar impacts on aggregate Western Hemispheric GDP in the static scenarios (Table 6a). Together, the two sub-regional agreements already constitute about 84% of the overall static impact that full Hemispheric free trade could have produced. Of the remaining 16%, in comparison, Brazil-U.S. free trade would contribute 12% of the additional static gains that could potentially be generated by an FTAA. In the context of externalities, however, NAFTA and MERCOSUR only constitute 60% of the overall gains potentially generated by Hemispheric free trade. Of the remaining 40% in potential gains, Brazil-U.S. free

trade would contribute 20%, indicating the relative dynamic potential of U.S.-Brazilian trade.

Not only is the Brazil-U.S. trade relationship by far the single largest potential contributor to overall Hemispheric gains from full trade liberalization, the liberalization of the bilateral relationship also represents the vast bulk of what each country can potentially expected from the FTAA. For the U.S, Brazil-U.S. free trade constitutes half of the potential remaining GDP benefits in the static scenarios and 85% of the potential benefits in the dynamic scenarios. For Brazil, bilateral liberalization would represent about 85% of potential benefits in both the static and externality scenarios. These relative contributions of bilateral versus complete hemispheric liberalization hold for virtually all other measures of benefit, including total exports (Table 6), intra-regional exports (Table 7) and factor wages (Table 9). While scenario 4 further reduces extra-regional exports for both Brazil and the U.S. in the static versions, the externality versions show Brazil excelling in extra-regional exports, again mostly due to the impact of bilateral liberalization. In terms of the sectoral composition of exports, a full FTAA would further accelerate the sectoral specialization originated in NAFTA and MERCOSUR and significantly enhanced by bilateral liberalization (Table 10).

The gains for Brazil to move beyond a strategy of expansion of MERCOSUR exclusive of the U.S. towards an FTAA inclusive of the U.S. thus appear quite large. Incremental GDP growth from moving to full hemispheric integration is also larger for the whole region. Moreover, all countries benefit from this step, with gains ranging from only 0.01 percent in the U.S. to more than 2 percent in Peru. Total hemispheric exports expand by 0.75 percent, led by growth of 4 percent or more in Brazil, Chile, Peru, and

Bolivia (see Hinojosa, Lewis and Robinson, 1997). The FTAA scenario thus appears to be the most favorable outcome for regional growth and exports. Led by the U.S. and Brazil, the final step of lowering barriers between the Northern and Southern Hemispheres would seem to have a substantial payoff, representing at least 40 percent of the total potential gains from hemispheric trade liberalization, only half of which is claimed by the U.S. and Brazil.

5. Conclusion

The Brazil-U.S.-FTAA-CGE modeling exercise was designed to establish an empirically rooted economic framework which could be used in the anticipated new round of FTAA analysis and discussions within a post-NAFTA and post MERCOSUR context. The modeling results of alternative scenarios provide insights and implications for the formulation of strategic trade policy by both the U.S. and Brazil individually, as well as for a framework of collective action throughout the Western Hemisphere.

The results clearly indicate that the Brazil-U.S. negotiation objectives will be central to a successful hemispheric round of trade liberalization. Without the participation of the U.S. and Brazil leading the process of trade liberalization, the benefits on a hemispheric level would be meager. Not only are freer US and Brazilian markets crucial for other countries, but all Latin America as a whole benefits from the gains to the U.S. and Brazilian economies of opening up to each other.

The results indicate that for both the U.S. and Brazil, there is essentially no strategic substitute to a commitment to lead the effort of hemispheric liberalization. The relatively larger benefits of U.S.-Brazil trade liberalization far outweigh any “hub and

spoke" strategy whereby either and/or both Brazil and the U.S. would attempt to establish a series of bilateral deals. This conclusion echoes previous work which showed that a full FTAA scenario would also be superior for both large and small countries in the hemisphere as well (See Hinojosa, Lewis and Robinson, 1997).

At first glance, our results would seem to indicate very small incentives to pursue any further regional integration from the point of view of the U.S., while other countries have relatively greater incentives to act. In common with most research on NAFTA, our simulation results show that any pattern of U.S.-Latin American integration can be expected to have relatively small positive implications for the U.S., but will have much more important positive or negative implications for all the other countries in the Hemisphere. While the aggregate effects of every alternative scenario are small for the U.S., there nevertheless are relatively important difference between scenarios, both for the U.S. and for the rest of the region.

Our modeling results provide a basis for ranking alternatives that are under consideration by U.S. policymakers: (1) full hemispheric free trade in an FTAA is preferential to new bilateral FTAs (including with Brazil); (2) the U.S. is better off in an FTAA than an incomplete set of NAFTA accessions, either individually or with a number of multi-country regional groupings; and (3) trade diversion with respect to the rest of the world becomes a more important concern as one moves towards a FTAA, but it is likely to be dwarfed by the positive impact of trade-related increases in productivity that are likely to accompany regional liberalization.

Regardless of whether it confronts these issues directly or tries to avoid them, the U.S. will influence and in turn be affected by future hemispheric integration initiatives.

The current post-NAFTA environment provides a unique opportunity for the U.S. and other countries in the hemisphere to exercise leadership in to encourage a cooperative and mutually beneficial outcome. However, our results point to a complex set of collective action problems between countries, sectors, and socio-economic groups in the region. Failure to resolve these problems could result in lower incomes, trade, and welfare throughout the region. Success will depend on favorable progress in a number of strategic areas:

(1) the U.S. must move beyond the current domestic political economy debate over the incidence of the costs and benefits from increased trade so that it can fill the needed strategic leadership role for the region (beginning with the Congressional granting of “fast-track” negotiating authority to the President); and

(2) countries throughout the region must resolve the "prisoners dilemma" collective action problem that discourages the cooperation needed to foster greater integration, and instead pushes countries towards competitive hub and spoke behavior that leaves the region worse off.

Of all the regional options, our results show that the FTAA generates the most favorable outcome for the most labor segments in the U.S. This is due to both a fall in the import prices of wage goods and a shifting of production to more productive export activities. But as the NAFTA debate revealed, crafting institutions that can convince the U.S. Congress that the adjustment burdens of adversely affected workers, sectors, and regions will be compensated for is a difficult political endeavor. However, this challenge is one that must be met: failure to move ahead would actually leave U.S. labor worse off compared to the post-NAFTA status quo.

Our results also show that a full FTAA inclusive of the U.S. provides particular important benefits to Brazil. Brazil not only has the most to gain in absolute terms from free trade with the U.S., but he quality of that gains is significant as well. Brazil's strategic objective of becoming a "global trader" is shown to be actually enhanced by free trade with the U.S., exporting rapidly not only to the U.S. market, but to extra-regional markets as well. While it can also be shown that free trade with the U.S. produces the lion's share of the additional growth in factor wages for all labor market segments in Brazil, free trade with the U.S. also accelerates the restructuring of sectoral trade specialization, including some absolute declines in exports and production. While the argument can be made that free trade with the U.S. will produce the bulk of additional new national resources to more than adequately deal with related adjustment costs, the actual implementation of credible mechanisms for adjustment assistance will have to be made in the current context of a equally necessary general reform of the state assistance for economic development.

In addition to the need for the U.S. and Brazil to resolve their domestic political economy problems so that they can provide regional leadership, our research also suggests some collective action challenges that the NAFTA and MERCOSUR economies will have to confront. Our analysis identifies a prisoner's dilemma situation where, in the absence of a credible multilateral negotiating mechanism, each country is left to fend for itself. While formation of a FTAA is the optimal scenario for the major members of NAFTA and MERCOSUR, the absence of a credible multilateral negotiation mechanisms causes these countries to discount this option. As a result, strategic relations both within and between NAFTA and MERCOSUR could become volatile, with each country having

a divergent set of second-best preferences as to how and with whom to proceed with trade liberalization.

If the U.S. tries to become a hub, or pushes NAFTA like preferences aggressively, this will likely spur Brazil into a defensive strategy to continue to build up agreements around MERCOSUR. As such agreements results in relatively low adjustment costs to its members, MERCOSUR would probably continue to win a race against NAFTA to establish free trade with its neighbors, resulting in a low preference outcome for the U.S.. To avoid these conflictive outcomes, the U.S. and Brazil have to cooperate on a common strategy to forge a most-favored-nation framework for rapidly establishing a comprehensive Western Hemisphere free trade area, allowing them to abandon their strategy of individual NAFTA or MERCOSUR like preferences or bilateral hub and spoke agreements.

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