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WORKING PAPER NO. 609

ALTERNATIVE SCENARIOS OF U.S.-MEXICO INTEGRATION: A COMPUTABLE GENERAL EQUILIBRIUM APPROACH

by

Raul Hinojosa-Ojeda
and
Sherman Robinson

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Abstract

This paper analyzes the economic impact on the U.S. and Mexican economies of creating a free trade area (FTA). The empirical analysis is based on a three-country (U.S., Mexico, and rest of world), multisectoral, computable general equilibrium (CGE) model. The model solves for prices, wages, profits, and the real exchange rate that achieve equilibrium in the goods markets, factor markets, and balance of trade. It includes international migration of rural and urban unskilled labor and rural-urban migration within Mexico. The model also solves for equilibrium sectoral production, consumption, exports, and imports in each country. The model represents a methodological advance over earlier multi-country trade models in its functional specification of sectoral import substitution possibilities and its inclusion of migration.

The empirical results indicate that: (1) The removal of import protection in the two countries, with no other changes, will have a tiny effect on the U.S. and a small effect on Mexico. (2) Assuming that the creation of an FTA is accompanied by additional policy changes so that Mexico succeeds in shifting to an open development strategy, trade between the two countries expands and both gain significantly. (3) The size of the potential gains is sensitive to assumptions about the possibilities for productivity gains and collateral policy changes accompanying the formation of an FTA. (4) The creation of the FTA and associated Mexican growth will generate adjustments in production and employment structure in both economies, although the effects are proportionately far larger for Mexico. (5) The impact of an FTA, by itself, on migration is small. On the other hand, successful Mexican growth significantly reduces the pressure for migration to the U.S. (6) The creation of an FTA, by itself, has almost no effect on real wages in either country. If Mexico succeeds in its shift in development strategy, real wages rise in both countries for most labor categories, but relatively more in Mexico. The effect on wages for unskilled workers in the two countries is very sensitive to assumptions about migration behavior.

1. Introduction and Summary

Official talks are currently underway between the United States and Mexico concerning the formation of a free trade area (FTA) between the two countries. The proposed FTA has generated a great deal of speculation, as well as some economic modeling, concerning the possible impact on the economies of North America. The impact of a U.S.–Mexico FTA must be evaluated in the context of the rich structure of integration that has been historically developing between the two countries. For over a century, Mexico and the U.S. have been the two most interdependent countries on opposite sides of the North-South divide, including strong trade, investment, and migration links.[1]

While clearly asymmetrical (Mexican gross domestic product, or GDP, is about 4% of U.S. GDP), economic performance in Mexico has important effects on the U.S. During the oil and debt boom of the 1970s, for example, both the volume of U.S.–Mexico trade and the U.S. trade surplus with Mexico increased dramatically. Following the debt crisis of 1982, the plunge in U.S. exports to Latin America and the need for major countries in the region to generate trade surpluses to service their large debts were important factors in the growth of the U.S. trade deficit in the mid 1980s.[2] Mexico and the U.S. are also facing growing labor market interdependence. Demographic trends indicate an aging and shrinking U.S. work force and a rapidly growing Mexican labor force through the end of the century.[3] These trends will generate potential labor-market complementarities, as well as serious adjustment problems, over the next twenty years.

Facing these looming challenges, Mexico starts with a relatively high level of industrialization and a skilled work force, which can provide the foundation for a dramatic transformation of its economy. The stated policy of President Salinas' administration, which took office in 1988, is to reverse Mexico's historic inward-looking development strategy and to pursue on outward-oriented strategy, following the lead of successful semi-industrial countries such as South Korea, Taiwan, Turkey, and Spain.[4] The successful achievement of an open development strategy, however, involves balancing a number of forces. The

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[1]Other comparators might be relations between Spain, Portugal, or Turkey and the European Community; Korea, Taiwan, and other Asian developing countries and Japan; or Franc-zone African countries and France. In these cases, the links are clearly not as strong as between the U.S. and Mexico. Reynolds and Tello (1983), Hinojosa (1989) and Weintraub (1990) discuss these links.

[2]Wharton Econometrics Forecasting Associates (1984).

[3]Reynolds, Hinojosa, and Bustamante (1991); Carnoy, Daley, and Hinojosa (1990); and Hayes-Bautista (1989) all discuss the implication of social, economic, and demographic trends on labor markets in the U.S. and Mexico.

[4]See Balassa (1989); Chenery, Robinson, and Syrquin (1986); and Corbo, Krueger, and Ossa (1985) for surveys of economic performance in countries which have pursued open development strategies. The discussion below of the nature of the transformation draws on Chenery, Robinson, and Syrquin.

country must be able to expand exports, penetrating world markets without a major deterioration in its terms of trade. The domestic economy must be flexible enough so that it can adjust the sectoral structure of resource allocation, production, and trade. Successful countries have historically been able to run major trade deficits in the early and middle phases of the process, enabling them to import capital goods and crucial intermediate inputs. In the early phases, these countries have typically pursued policies to influence the structure of imports, favoring intermediates and capital goods relative to consumer goods. Finally, there must be rapid productivity growth, especially in the exporting sectors, in order to sustain the rapid growth and structural change. Without productivity growth, the process will eventually falter.[5]

In the current context of U.S.–Mexico relations, successfully achieving a similar change in development strategy poses important challenges, both economic and political. Mexico is starting the transition with a trade surplus and only limited possibilities for increased foreign borrowing, unless its large debt-servicing requirements are reduced. In addition, Mexico has recently greatly reduced import protection, with resulting large increases in imports, including consumer goods. While Mexico's proximity to the U.S. could clearly be an asset in terms of access to markets and technology, there are also potential problems. In marked contrast to the situation in the successful, outward-oriented, developing countries, most of Mexican manufacturing exports are produced by U.S. multinationals. This industrial organization might be helpful for technology transfer, but might also impede the development of competitive market structures. In addition, U.S. accommodation to changes in trade relations with Mexico could be politically difficult, given the initial large Mexican debt overhang and the need to sort out the debt problem while also negotiating a trade agreement. Given demographic trends in the next decade, Mexico will need to quickly generate employment opportunities and income growth to absorb the growing entrants into the labor force and to contain the pressure for migration to the U.S.

Seen in a comparative perspective, the process of U.S.–Mexico integration could proceed in a variety of directions. At one extreme, there is the sort of informal trade integration evolving in Asia between Japan and its trading partners in which participants tolerate wide disparities in levels of development. At the other extreme, the European Community is in the process of completing economic integration, harmonizing internal and external policies, with an explicit goal of reducing regional inequalities within the Community.

While there are lessons to be drawn from the experience of other semi-industrial countries, especially Spain's entry into the Common Market, there are many unique aspects to Mexico's situation. The success of the new strategy for Mexico in terms of sustainable growth and equitable income distribution will depend on the final mix of trade, financial, and labor market policies that would accompany a politically viable vision of medium-term adjustment in the North American region. Institutionally, the formation of an FTA is a modest step. Managing issues of regional development disparities, environmental

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[5]There is some evidence that rapid productivity growth is correlated with rapid export growth at the sectoral level. See Nishimizu and Robinson (1984) and Westphal (1982). However, the causal links are certainly not yet well understood.

degradation, and conditions of employment will require a greater degree of harmonization and institution building than is currently being considered in FTA negotiations.

This paper focuses on the potential economic impact of the creation of an FTA on the U.S. and Mexican economies and on their economic relations. In addition to analyzing the impact of removing trade barriers, we also consider changes in migration, capital flows, and productivity that might accompany the creation of an FTA. For the empirical analysis, we developed a three-country, seven-sector, trade-focused, computable general equilibrium (CGE) model which includes the U.S., Mexico, and the rest of the world. We use the model as a policy laboratory, doing a variety of experiments under various trade, capital, productivity, and migration scenarios.

CGE models are particularly well suited for studying interdependent economies and trade liberalization.[6] In common with all empirical economic models, however, they must be used with care. The results should not be viewed as "forecasts," but instead as indicating the potential impact of different policy choices and external shocks. Starting with a model that captures the relevant structure and operation of the two economies, the empirical results are nonetheless conditional on a host of assumptions about the external environment and policy choices. This type of model is especially valuable in capturing the important mechanisms through which policy changes affect the two economies in the medium to long run, and in tracing out the empirical importance of links between them. Through a series of "what if" experiments, the model can be used to analyze how sensitive economic performance in the two economies is to changes in policies and in the external environment.

In the next section, we discuss the context of U.S.–Mexico interdependence, considering the structure of the two economies and their trade, migration, and capital-flow linkages. We describe the environment in which the proposed FTA must work, and the essential features we seek to capture in the CGE model. In the following section, we present our model and compare it to other multi-country CGE models, including recently developed U.S.–Mexico models.

We then present the results of five experiments with the model which consider alternative policy scenarios and their impacts. This presentation is done in a step-by-step manner, building composite experiments from separate components, in order to isolate the underlying assumptions of each set of results. Given the model results, we conclude with an evaluation of the potential impacts of the establishment of an FTA in the overall policy context within which it is implemented. We also place these results in the context of important long run trends in the North American economies, including productivity and labor market trends.

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[6]Such models have been widely used to study the impact of proposed trade liberalization in the Uruguay round of GATT negotiations. See Goldin and Knudsen (1990) and OECD (1990) for a summary of this work. The first multi-country CGE model was developed by Whalley (1985) to study the impact of the Tokyo round of GATT trade negotiations. Single-country CGE models used to analyze the impact of the Uruguay Round are surveyed by Robinson (1990).

The general conclusions from the empirical experiments with the FTA-CGE model are:

• The lowering of tariffs and non-tariff barriers (NTBs) by themselves has a relatively minor impact on the U.S. economy. The impact on the Mexican economy is greater, which is to be expected given the relative size of the two economies.

• Even under pro-competitive assumptions, including productivity gains from decreasing factor-market distortions, the creation of an FTA has much less effect on the U.S. economy than changes in trade relations currently under discussion in the Uruguay Round of GATT negotiations. This result is hardly surprising, given the relatively small size of U.S. trade with Mexico compared to trade with Europe and East Asia.

• If the creation of an FTA is accompanied by other policies which together succeed in achieving increased Mexican growth, there will be increased trade with the U.S. and net benefits to both economies. The potential gains depend largely on collateral policy changes accompanying the creation of an FTA, such as changes in foreign investment flows and debt relief, which affect Mexican growth. In general, while the gains are proportionately greater for Mexico, they are also significant for the U.S.

• The creation of an FTA will result in the movement of labor and capital across sectors in both economies. These structural adjustments are proportionately far larger for Mexico than for the U.S. In both countries, however, the size of the adjustments are small relative to the aggregate capital stock and labor force. In the U.S., the required adjustments are a fraction of the factor movements typically observed during the business cycle. In Mexico, they are far smaller than the swings observed in the past decade, as the Mexican economy has dealt with recurring crises.

• The creation of an FTA, by itself, has almost no effect on real wages in either country. If Mexico succeeds in its shift in development strategy, real wages rise in both countries for most labor categories, but relatively more in Mexico. The effect on wages for unskilled workers in the two countries is very sensitive to assumptions about migration behavior.

• The creation of an FTA, by itself, does not significantly reduce the pressure for Mexican migration to the U.S. On the other hand, successful Mexican growth significantly reduces the pressure for migration to the U.S. The migration results are very sensitive to assumptions about demographic trends and migrant response to wage differentials. Our modeling approach is to consider two extreme cases, which highlight the significant impacts that migration patterns have on output and income levels in both countries.

• For Mexico, there is a potential structural adjustment problem in managing the transition to a new, open development strategy under an FTA. Highly traded sectors whose performance is sensitive to changes in the real exchange rate have already experienced swings in profitability as the exchange rate devalued in the 1980s. A return to foreign capital inflows and trade deficits in the 1990s will lead to a transitory appreciation of the real exchange rate, with a negative effect on export sectors.

2. The Dynamics of U.S.–Mexico Interdependence

For the second time in the 20th century, the U.S. and Mexico are reorienting their economic and political relations. The Mexican decision to initiate talks on an FTA represents a decisive reversal of the inward-looking policies adopted after the 1910 Revolution and followed consistently throughout the post World War II era. While the decision to initiate negotiations can be seen as resulting from conjunctural economic and political trends in the late 1980s, the forces driving the countries towards greater integration have been operating for decades. The negotiations are taking place at a critical moment in the development of both countries. The U.S., as well as Europe and Japan, are seeking new roles within an emerging multi-polar world characterized by growing regionalism. Mexico and other developing countries are seeking a new strategy for economic development. The debt crisis has forced a number of countries to confront the declining viability of import substituting industrialization (ISI).

The special relationship between Mexico and the U.S. has epitomized, and at times presaged, the dynamics of long phases of North-South interactions. With the launching of negotiations for a U.S.–Mexico FTA, the two countries are again assuming a leading role.[7] While there have been other recent moves towards regional integration, the current shift in North America represents an unprecedented challenge: the successful building of an economic union between highly unequal partners.[8] Its success or failure will also have important impacts on the dynamics of global interaction and balance between emerging blocs.[9]

Relations between Mexico and the U.S. have evolved over time, following distinct phases of policy regimes involving trade relations, capital flows, and migration. During this century, three major patterns of interaction can be observed: (1) the Porfiriato period, (2) the post World War II period, and (3) the debt crisis period.

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[7]As in the shift to ISI in the post-war era, the new change signals a fundamental shift in relations between North and South. Soon after the announcement that Mexico and the U.S. would initiate discussions on an FTA, President Bush announced the "Enterprise for the Americas" initiative designed to provide a framework for other Latin American countries to follow the U.S.-Mexico model. While a number of Latin American countries have expressed interest in the initiative, Mexico has moved forward in discussing the establishment of its own FTAs with Chile and the Central American republics.

[8]The imbalance in North America is much greater than that between Northern Europe and Spain, Portugal, and Greece. The U.S.-Mexico gap also is wider than that between Japan and most of its Asian neighbors, except China.

[9]See Gilpin (1989) on the political economy of emerging global trading blocs and a critique by Krasner (1989). Shott (1990) discusses the impact of FTAs in the context of global U.S. trade policy.

The Porfiriato Outward-Oriented Strategy

Late in the 19th Century, under the authoritarian rule of Porfiro Diaz (1877-1911), Mexico experienced a period of political stability and rapid, export-led growth. The growth was distributionally unequal, with widening economic and social inequality. Displaying the classical 19th century relationship between center and periphery, the U.S. invested heavily in Mexican primary production, which was exported to U.S. industrial sectors. The U.S., meanwhile, exported manufactured products to Mexico, including capital goods and consumer goods demanded by the rich. During the Porfiriato, there were various failed attempts to negotiate explicit treaties between Mexico and the U.S. guaranteeing freer trade and investment.[10] Even so, trade expanded rapidly, as did investment and debt. The first mass migrations to the U.S. also began during this period, generated in part through the recruitment of labor by U.S. agricultural, railroad, and industrial enterprises.

The outbreak of the Mexican revolution in 1910 initiated a new phase of political turmoil and economic disarray, but which nonetheless set the stage for the development of new stable political institutions and the launching of an era of even greater economic growth.[11] The role of the U.S. in the transition to a new Mexican development path, particularly its constructive attitudes during the 1940s, was essential in consolidating the new mutually beneficial pattern of trade, investment, and migration relations.[12]

Postwar Inward-Oriented Development

During much of the postwar period, the sources of growth in both the U.S. and Mexico were based on domestic market expansion and changes in the structure of demand for intermediate goods. The 1950s ad 1960s were the period of Mexican "miracle" based on import substituting industrialization, as well as on the long and prosperous expansion associated with U.S. "Fordism."[13]

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[10]Espinoza de los Reyes (1951).

[11]Reynolds (1970) discusses this successful transition in Mexican development strategy.

[12]Hinojosa (1989) discusses the negotiations between the U.S. and Mexico which established the post World War II pattern of economic and political relations. During the 1940s, a series of bilateral agreements were reached which provided: (1) a nearly 90 percent reduction in Mexican debt (defaulted since the time of the Revolution); (2) a regulated program for the migration of Mexican workers which, at least in the early phases, provided guarantees on wages and working conditions; and (3) new trade and investment agreements whereby the U.S. accepted the Mexican decision to move towards ISI, which boosted U.S. capital goods exports and multinational investment.

[13]The term "Fordism" has been used to describe the interrelated economic and political dynamics of the expansion of mass production technology and rising mass consumption based on increased real wages. Piore and Sable (1984) and Marglin and Schor (1990) discuss the U.S. case, while Hinojosa (1991) discusses U.S.-Mexico relations.

Trade and financial relations expanded moderately, with little change in the structure of trade and within the framework of complementary institutions and policy regimes in both countries. Mexico exported agricultural products and raw materials, while importing capital and intermediate goods. Import substitution expanded in light manufacturing and consumer durables. Mexico was able to run large trade deficits during this period, which were financed by aid transfers, direct foreign investment, and, later, commercial bank debt. This pattern of ISI was very similar to that followed by many developing countries at the time, including Korea, Brazil, Taiwan, Turkey, and Spain.

The modern contours of labor market interdependence between the U.S. and Mexico emerged in this period. Pursuing an ISI strategy, Mexico tended to sacrifice rural development in favor of urban industrialization. Pressure grew for rural-urban migration within Mexico. In addition, U.S. demand for rural and urban unskilled labor also grew. Given the limited unionization of the work force in both countries, with unions centered mostly in urban manufacturing, wage and labor market segmentation grew more pronounced in both countries. Rising real wages, the political mainstay of the "class compromise" in both countries during this era, were concentrated in organized labor.[14]

This pattern of inward-looking development showed signs of structural exhaustion in the late 1960s. The early 1970s saw some attempts in Mexico to shift to an outward orientation, while maintaining much of the ISI focus. Manufactured exports began to expand and the Maquiladoras experienced their first boom.[15] The growth of employment, however, was still unable to absorb continued acceleration of new entrants into the labor force. Pressure for migration to the U.S. grew, as did the demand for urban unskilled labor in the U.S. service sectors and in some manufacturing sectors.[16]

In the mid-1970s, Mexico faced growing economic and political difficulties in shifting to a more open economy, as well as accumulating social demands. The discovery of oil and new access to expanding international capital markets enabled Mexican leaders to postpone difficult strategic choices. During this period, Mexico tried to have it all: maintenance of old ISI plants, investment in new export-oriented production, rapid employment growth, and real wage growth. At the same time, the U.S. was shifting from its domestic-oriented pattern of growth, internationalizing both its productive and financial sectors. The Mexican debt-aided growth benefitted the U.S. during this period by providing a rapidly increasing export market as well as a plentiful new oil supply. The original discussion of a North American common

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[14]Hinojosa and McCleery (1991) analyze the interaction between capitalists and workers in reaching a "class compromise" within a small U.S.-Mexico CGE model which also includes migration.

[15]The Maquiladora, or in-bond, production program was established in 1965 at the time that the bracero guest-worker program was terminated. Maquiladora enterprises import raw materials from the U.S. duty free and export processed goods back to the U.S. paying duty only on value added. The expectation was that establishing a border export processing zone would generate employment opportunities to absorb the pool of potential migrants.

[16]See Morales (1984) and Hinojosa and Morales (1991).

market emerged at this time, with the view that Mexico would provide energy and labor and the U.S. would provide capital and technology.[17]

Debt Crisis and Response

This pattern of economic interdependence soon proved unsustainable. Mexican debt grew from $6.6 billion in 1971 to $84.9 billion in 1982.[18] The policy was to maintain growth in the face of a world recession, falling commodity prices, and rising real interest rates. Capital flight accelerated in 1981, as the price of oil fell. The government failed to cut spending, the peso became dangerously overvalued, and the rate of inflation rose rapidly. With the announcement in August 1982 that Mexico could not meet its debt-service obligations, virtually all lending stopped.

The outbreak of the debt crisis in 1982 ushered in a dramatic transformation in U.S.–Mexico relations. Under severe stabilization and adjustment programs in Mexico, real wages, domestic demand, and aggregate investment all fell. Average annual Mexican imports from 1979 to 1981 were $18.2 billion, while they dropped to an average of $11 billion a year from 1983 to 1986, an average loss of $7.2 billion a year, or $28.8 billion from 1983 to 1986. Since the U.S. accounted for about 65% of Mexican imports, the export loss to the U.S. was a cumulative $18.7 billion from 1983 to 1986.

These developments in Mexico and other Latin American countries also had serious implications for the U.S. economy. Due to a fall in Latin American imports and an increase in their exports between 1981 and 1984, the U.S. trade position with Latin America shifted from a $7 billion surplus to a $16 billion deficit, the largest single component of the change in the U.S. trade deficit during this period.[19] The drop in production for exports and increase in import competition has been estimated to have resulted in a net loss of over one million jobs in the U.S. manufacturing sector.[20]

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[17]See Weintraub (1990) and Pastor and Castaneda (1989).

[18]World Bank, World Debt Tables, (various years).

[19]Putting the impact of the debt crisis in perspective, between 1981 and 1984, the U.S. trade balance with Japan deteriorated by slightly more than $18 billion, with the deficit rising from $16 billion to $34 billion. During the same interval, the U.S. trade position with Latin America deteriorated by $23 billion, shifting from a $7 billion surplus to a $16 billion deficit. By 1984, the U.S. trade deficit with Latin America was larger than the U.S. trade deficit with Western Europe, OPEC, or Canada. Only Japan and the four East Asian NICs taken as a group — Hong Kong, Korea, singapore, and Taiwan — were running larger trade surpluses with the U.S. Wharton Econometrics Forecasting Associates (1984) calculated that 70 percent of the worldwide decline in U.S. overseas sales between 1980 and 1983 can be attributed to falling demand in Latin America, and 55 percent of Latin America's $26 billion import reduction came at the expense of U.S. producers.

[20]Estimates of the impact of the debt crisis on U.S. employment range from 1.1 million jobs lost [USITC (1985)] to 1.4 million [Overseas Development Council study cited in Sewell and Tucker (1988)].

strategy did so under the rule of authoritarian regimes. The political success of a North America FTA will require that integration provide a more balanced pattern of growth and distribution. Underlying the ability to meet these political requirements are three interrelated economic challenges in the areas of labor, capital, and productivity that North American economies will have to manage in the next decade.

Labor market interdependence: The annual growth rate of the Mexican population has slowed from 3.5 percent in 1970 to 1.7 percent in 1990. The Mexican labor force was growing at 3.6 percent a year in 1988, and the growth rate is projected to fall to about 2.1 percent by the year 2000.[26] Estimates of the potential migration flows from Mexico to the U.S. range from a net annual increase of 110,000 to 500,000, depending on assumptions concerning the expansion of the migration pool to include new regions outside the traditional originating areas of west central Mexico.[27]

Population growth in the U.S., meanwhile, is slowing rapidly, from about 1.9 percent a year in the 1950s to about 0.7 percent by the year 2000.[28] Labor force growth is expected to continue falling throughout the decade, from about 1.7 percent in 1988 to 1.0 percent by the year 2000. The average age of the population and work force will rise and the pool of young workers will shrink. Immigrants will contribute a large share of the increase in both the population and the work force, in a magnitude not seen since the large waves of immigration before World War I.[29] Latinos as a share of the work force will continue to increase, and also continue to be more highly represented in the lower-paid occupational categories.[30]

The differential age structures and patterns of labor force growth allow for potential complementarities or conflicts between the U.S. and Mexico, depending on the way relative wages and employment patterns are allowed to develop. Labor absorption and migration rates between the two countries will depend on the relative rates of investment, employment, wage, and productivity growth. The U.S. is expected to experience a shortfall in its labor supply, even under assumptions of high productivity growth. Mexico will need to generate high growth of labor absorption, especially if there is productivity growth throughout the economy and a continued shift out of agriculture.[31] Such a temporary "hump" in labor supply is a common phenomenon in developing countries. Spain, for example, also experienced rapid labor force growth and out-migration, followed by a return migration once the home economy began growing rapidly. The labor supply expansion in Mexico, however,

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[26]Instituto Nacional de Estadistica Geografia e Informatica y Consejo Nacional de Poblacion, (1985).

[27]Garcia y Griego (1989).

[28]U.S. Bureau of the Census (1988).

[29]Johnston (1987), p. xx.

[30]See Carnoy, Daley, and Hinojosa (1990) and Spencer (1986).

[31]Reynolds (1983) estimates that Mexico must have sustained a growth of output of +7% to soak up its large pool of unemployed and under-employed workers.

is happening during a difficult period of economic adjustment, with slow growth of labor demand.

Debt and Investment: Mexico currently owes about $93.1 billion dollars in long-term external debt. While down from a high of $107.1 billion in 1988, before the implementation of the Brady Plan, there is still a servicing burden of about $8–9 billion a year.[32] No country has successfully made the transition to outward-oriented growth in the context of such a large debt overhang.[33] Most began the process with a large trade deficit and net capital inflows.

The large Mexican debt burden must be financed through new capital inflows and/or trade surpluses. Recent capital inflows have consisted of direct foreign investment, remittances, tourism, a boom in Maquiladoras, as well as returning Mexican capital flight and new "hot" money investing in the Mexican stock market. The large trade surpluses Mexico has generated in the 1980s have been due to a significant increase in non-oil exports, mostly by U.S. multinational corporations retooling for the external market.[34]

If Mexico is to grow at the rate needed to absorb its labor force and have enough foreign exchange to import needed capital goods and intermediates, it will need to have either huge capital inflows or some form of temporary debt relief. Such debt relief could come in a variety of forms, such as debt-equity swaps or capitalization of interest payments.[35] One idea is to use the outstanding debt to capitalize a regional development bank, targeting infrastructure and environmental investment projects. There is a need for a regional development bank to facilitate North American integration, however capitalized. The recent establishment of a regional development bank to invest in Eastern Europe is an important precedent. Similarly, the Common Market established a regional development fund to assist new entrants such as Spain and Portugal.

Trade and Productivity: Mexico today is one of the most open economies in the world, certainly among developing countries. An FTA should have a positive impact to the extent that needed inputs for production will be imported at world prices, unlike the 1970s when protection was very high, even for capital goods and intermediate inputs, and the exchange rate was also overvalued. Mexico will need these capital and intermediate goods to generate productivity growth — a key element of the new development strategy.

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[32]World Bank, World Debt Tables, (1990); Nomura Research Institute, (1990).

[33]Debt/GDP ratios in Latin America in 1987 were: Mexico, 75.8%; Argentina, 78.8%; Venezuela, 73.4% By contrast, the ratios for South Korea in 1970 was 39% and for Turkey in 1970 was 18%. World Bank (1990).

[34]Unger (1990) and Dehesa (1982).

[35]Van Wijnbergen (1989), however, argues that debt-equity swaps will destabilize the domestic economy if they lead to more rapid monetary growth.

Given Mexico's skewed income distribution, adoption of U.S. tastes, and resulting high propensity to consume imports, trade liberalization has already led to a large increase in imports of consumer durables. Other countries which shifted to an outward-looking development strategy started with much lower shares of consumer goods imports. The difference in import structure poses a potential problem for Mexico in that one link between liberalization and productivity growth works through increased imports of capital goods and intermediates, but not through increased imports of consumer goods.

Changes in relative prices and increasing productivity imply the need to shift resources to take advantage of new opportunities and new patterns of specialization. Such restructuring will require relative shifts of labor and investment across sectors in both countries. Policies in both countries should be developed to foster factor mobility, since restructuring is a crucial part of achieving the benefits from establishing an FTA. Such policies might include labor retraining programs, infrastructure investment, and assistance for affected communities. The problem is potentially much more serious for Mexico, which is much smaller and poorer. Special attention must be paid in Mexico to the agricultural sector, where changes in production patterns may well lead to major labor displacement.

Political leaders in both the U.S. and Mexico are currently engaged in a gamble that the formation of an FTA will generate the resources needed to achieve a successful transition to a new pattern of integration and growth. Preliminary discussions have sought to exclude issues such as oil, migration, and debt relief from the trade negotiations. The experience of other developing countries indicates that the shift in development strategy requires more than just liberalizing trade. While the FTA negotiations may be narrowly defined, the two countries must address a wider range of issues if the policy gamble is to pay off. In particular, debt relief and the need for additional investment resources are crucial.

Model Base Data for 1988

Tables 1–3 provide basic comparative data for the U.S. and Mexico for 1988, the base year of our model. Table 1 shows the large disparities between the two economies — roughly 20 to 1 in terms of aggregate GDP and 10 to 1 in per capita GDP. While North America has a higher combined GDP than the European Community, the differences within North America are greater than those within the European Community. Table 1 also shows the structure of production and employment for the two economies. Agriculture and light manufacturing are relatively much more important in Mexico, which is typical of a semi-industrial country. The U.S. has a much higher share in services. The structure of employment in Mexico is relatively more concentrated in agriculture and urban unskilled (26.7% combined) than in the U.S. (18.7%). Skilled labor is a much higher share in the U.S., while white collar workers are roughly the same share in both countries.[36]

[36]The definitions of the sectors and labor categories used in the model are given in an Appendix.

Table 1: Comparative Data, U.S. and Mexico

	Mexico	U.S.
GDP ($ billions, 1988)	176.7	4,847.4
Per Capita GNP ($, 1988)	1,760	19,990
Trade flows (percent of GDP)		
Total exports	13.6	7.1
Exports to partner	10.1	0.2
Total imports	12.0	10.1
Imports from partner	6.3	0.4
Structure of GDP (percent)		
Agriculture (AG)	7.5	1.6
Oil and refining (OL)	2.6	2.2
Light manufacturing (LM)	13.0	6.0
Intermediates (IN)	8.1	5.4
Consumer durables (CD)	2.1	1.8
Capital goods (KG)	3.3	5.0
Services (SE)	63.4	78.0
Total	100.0	100.0
Employment structure (percent)		
Rural labor	13.1	1.4
Urban unskilled labor	13.6	17.3
Skilled labor	38.8	48.6
White collar workers	34.6	32.7
Total	100.0	100.0
Population, ages 15-64 (millions)	49	162
Total population (millions)	84	246

Sources: GDP, per capita GNP, and population data refer to 1988 and come from World Bank, World Development Report 1990. All other data come from U.S. and Mexican social accounting matrices. The data for Mexico are updated from a 1985 base SAM, and are preliminary. The data for the U.S. are updated from a 1986 base SAM developed by the Economic Research Service, U.S. Department of Agriculture (USDA/ERS).

Table 2: Aggregate Trade Flows Among the U.S., Mexico, and Rest of World, 1988

Exports	Imports ($ billions) U.S.	Mexico	Rest of world	Total
U.S.	—	11.1	334.7	345.8
Mexico	17.9	—	6.1	24.0
Rest of world	471.6	10.1	—	481.7
Total	489.5	21.2	340.8	—
Trade balance, exports minus imports	-143.7	2.8	140.9	0.0

Notes: Data from the U.S. and Mexican social accounting matrices. Trade in goods and non-factor services. The trade balance, by definition, sums to zero across all three accounts. Data for U.S. trade with Mexico come from Mexican sources.

Table 3: Structure of U.S. and Mexican Exports

Sector	Mexican exports to: U.S.	Rest of world	U.S. Exports to: Mexico	Rest of world
	$ millions		$ millions	
Agriculture (AG)	722	128	305	14,555
Oil and refining (OL)	1,518	1,256	639	8,726
Light manufacturing (LM)	1,862	964	1,678	32,599
Intermediates (IN)	2,153	1,300	2,102	42,442
Consumer durables (CD)	2,477	1,256	1,691	32,335
Capital goods (KG)	1,366	699	3,408	107,503
Services (SE)	7,775	533	1,300	96,541
Total	17,873	6,136	11,123	334,701

Source: Base SAM for FTA-CGE model. See Table 1.

The relative importance of trade for the two countries is shown in Tables 1 and 2, while Table 3 indicates the sectoral structure of their trade. Mexico has a higher trade share than the U.S., although it is much lower than the average of middle income countries (where exports typically are around 25% of GDP). For both countries, trade shares have grown significantly over the past 20 years. The relative importance of the bilateral trade for the two countries can be seen in Table 2. Trade with Mexico is only 4% of total U.S. trade, even though Mexico is the U.S.'s third largest trading partner after Canada and Japan. Trade with the U.S., however, represents over 70% of total Mexican trade, a figure which has grown from 60% during the 1980s. Table 2 also shows the large U.S. trade deficit (–$143.7 billion, or about 3% of GDP) and the Mexico trade surplus (about 2% of GDP). The Mexican trade surplus with the U.S. is only about 4% of the U.S. total deficit.

Table 3 shows the structure of exports of the two countries. Mexico has a trade surplus with the U.S. in all sectors except capital goods, where the U.S. has a large surplus. Mexico's large surplus in services in part reflects the fact that Maquiladora exports are registered as a service sector export in the national income and product accounts.

3. Description of the FTA-CGE Model

The U.S.–Mexico FTA-CGE model we have developed is in the tradition of recent multi-country CGE models developed to analyze the impact of the Uruguay Round of GATT negotiations. These models, in turn, have built on multi-country models developed to analyze the impact of the Tokyo Round of GATT negotiations — 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.[37]

The FTA-CGE model consists of two single-country, seven-sector, CGE models, one for Mexico and one for the U.S., linked through commodity trade flows and labor migration. As in the WALRAS model, there is a simple representation of the rest of the world, which is modeled as a large supplier of imports to, and demander of exports from, both the U.S. and Mexico at fixed world prices.[38] The country CGE models follow closely what has become a

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[37]This model was developed by a team led by John Martin at the Growth Studies Division at the OECD and was originally designed to study agricultural trade liberalization among the major OECD-member countries. It is described in detail in OECD (1990). There is a project currently underway at the OECD to extend the WALRAS model to consider problems of worldwide environmental degradation. Another multi-country CGE model, called the RUNS model, is also under development at the OECD Development Centre to explore the impact on developing countries of the current round of GATT negotiations. That model is described in Burniaux and van der Mensbrugghe (1990).

[38]It is straightforward to model the rest of the world as having upward sloping export-supply curves and downward-sloping import-demand curves, but this treatment seemed unnecessary at our level of aggregation, especially given our focus on U.S.-Mexico bilateral trade. In a more dissaggregated model, the alternative specification might be desirable.

standard theoretical specification for trade-focused CGE models.[39] For each sector, the model specifies output-supply and input-demand equations. In addition to seven sectors, the model has six factors of production in each country: land, capital, rural labor, urban unskilled labor, skilled labor, and white-collar workers.

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 an exchange rate.[40] These solution prices achieve market-clearing equilibrium in factor markets, product markets, and the balance of trade.

In common with other CGE models, the model only determines relative prices and the absolute price level must be set exogenously. In the FTA-CGE model, the aggregate consumer price indices in both Mexico and the U.S. are set exogenously, defining the numeraire in both countries. The advantage of this choice is that solution wages and incomes are in real terms. The solution exchange rates in the two countries 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.[41]

The two country CGE models are linked through trade and migration flows. The model specifies sectoral export-supply and import-demand functions for each country, and solves for a set of world prices that achieves equilibrium in world commodity markets. Migration between Mexico and the U.S. is assumed to be a function of wage differentials between the two countries, with international migration occurring in the rural and urban unskilled labor categories. Equilibrium international migration levels are determined which maintain a specified ratio of real wages in the two labor categories in the two countries, measured in a common currency. In addition, there is rural-urban migration within Mexico which maintains a given wage ratio in the rural and urban unskilled labor categories within Mexico.

The country models incorporate official tariffs and the tariff equivalent of non-tariff barriers. In addition, the two economies are assumed to include a number of market distortions. There are sectorally differentiated indirect taxes (U.S.) and value-added taxes (Mexico), with non-uniform rates. In both economies, factors are not assumed to receive a uniform wage or "rental" (in the case of capital) across sectors. Based on data for the base

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[39]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-focused CGE models are discussed in Devarajan, Lewis, and Robinson (1990).

[40]The model is specified and solved using a software package called GAMS (General Algebraic Modeling System). See Brooke, Kendrick, and Meeraus (1988).

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

year, we impose sectoral "factor market distortion" parameters that fix the ratio of the sectoral return to a factor relative to the economywide average return for that factor. These distortion parameters range from about 0.5 to 2.5 in the U.S., and from about 0.5 to 5.0 in Mexico.[42]

One implication of this specification of existing distortions, which captures in a stylized way institutional constraints characteristic of the two economies, is that policy-makers are assumed to operate in a "second best" environment. In the scenarios involving the establishment of an FTA, we are not considering policies which remove all other existing distortions. Existing taxes and factor-market distortions are assumed to remain in place, as are existing import barriers in both countries against the rest of the world. In this "second best" environment, economic theory gives little guidance as to the welfare implications of forming an FTA. In fact, in our experiments, the aggregate production effects are largely determined by the movement of labor and capital across sectors with different productivities.[43]

Related CGE models of U.S.–Mexico trade are currently under development at the International Trade Commission (ITC), at a private consulting company, KPMG Peat Marwick (Policy Economics Group), and at the U.S. Department of Agriculture (Economic Research Service).[44] Currently, the ITC has developed a very small model, which has been used to generate some preliminary empirical results. Given its size and theoretical structure, however, the current ITC model should be seen more as a stylized model designed to illustrate theoretical links rather than as a model suitable for policy analysis.[45] Hinojosa and McCleery (1991) have also developed a stylized U.S.–Mexico CGE model with two sectors and two labor categories. The FTA-CGE model builds on the Hinojosa-McCleery model for the specification of migration.

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[42]In Mexico, for some labor categories in some sectors, the values are higher, but the numbers of workers involved are very small.

[43]The FTA-CGE model embodies some of the features considered by Katz and Summers (1988) and Dickens and Lang (1988) in their discussions of the role of trade policy when factor markets are distorted.

[44]There are also CGE modelling projects underway to analyze an FTA that includes Canada, as well as the U.S. and Mexico, but there are no results yet from these projects. In particular, the Michigan model, which was adapted to analyze the creation of a U.S.-Canada FTA, is being extended to include Mexico. See Brown and Stern (1989). Coughlin (1990) reviews modeling work anlayzing the impact of establishing a U.S.–Canada FTA.

[45]The ITC model has two sectors and two labor categories. The ITC is currently developing a larger version of their model. The preliminary results from the small model are described in ITC (1991). However, there is as yet no documentation of the small model available. The AFL-CIO have drawn on the preliminary results described in the ITC study [e.g., AFL-CIO (1991)], especially the reported result that under one scenario the real wage of unskilled labor in the U.S. falls slightly. While the ITC paper did not discuss the model methodology in detail, it did note the small size of the wage effects and the sensitivity of even the sign of the results to alternative assumptions. We replicate the ITC scenario with our model and confirm the tiny size of the effect. We discuss these results below.

The KPMG model is much larger, including 44 sectors, and is a close cousin to the OECD's WALRAS model in theoretical specification.[46] The KPMG model differs from our FTA-CGE model in specification of functional forms for production technology, trade substitution possibilities, and labor markets. In addition, the KPMG model does not include international migration. The two models are similar in their treatment of trade policies, including tariffs and non-tariff barriers (NTBs). They also share the same data base for Mexico and the U.S. Both start from a U.S. CGE model developed at the Economic Research Service, U.S. Department of Agriculture (USDA/ERS) to study the impact of agricultural trade liberalization on the U.S. economy.[47] Work is underway at the USDA/ERS to expand the FTA-CGE U.S.–Mexico model to include more agricultural sectors and to model agricultural policies in both countries.

In common with other multi-country CGE models, the FTA-CGE model specifies that goods produced in different countries are imperfect substitutes. At the sectoral level, in each country, demanders differentiate goods by country of origin and exporters differentiate goods by country of destination. For single-country models and the early world models, a lack of detailed econometric work forced modelers to use simple functional forms, with few parameters, for the import-aggregation and export-transformation functions. Standard practice was to use a constant elasticity of substitution (CES) function for the import aggregation equation, which is a very restrictive functional form and led to empirical problems.[48]

In a multi-country model, the assumption of fixed sectoral share parameters in a multi-country CES function largely determines the volume and direction of world trade, with price changes only affecting shares at the margin. It also constrains the income elasticity of demand for imports to be one in every sector, so there is no possibility of market penetration without major changes in relative prices. Given that only relative prices affect trade shares, one result is that the model endows every country with unrealistic market power in its export markets, with potential national welfare gains from restricting trade. In addition, with all income elasticities set to one, such models cannot replicate the major expansion in trade that has characterized the postwar era, with the growth rate of the volume of world trade greatly exceeding the growth rate of world GDP.

In both single-country and multi-country models, it is time to explore other formulations, while maintaining the fundamental assumption of product differentiation. In the FTA-CGE model, we have used a flexible specification of the demand system called the

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[46]Preliminary results from the KPMG model are presented in an executive summary, KPMG (1991). The final report is in preparation.

[47]The U.S. model is described in detail in Robinson, Kilkenny, and Hanson (1990).

[48]Armington (1969) used the specification in deriving import-demand functions, and the import aggregation functions are sometimes called Armington functions. Devarajan, Lewis, and Robinson (1990) discuss in detail the properties of single-country models which incorporate imperfect substitution. Brown (1987) analyzes the implications of using CES import aggregation functions in multi-country trade models. Others have criticized the use of the CES function on econometric grounds. See, for example, Allston *et al.* (1989).

almost ideal demand system (or AIDS).[49] The major advantage of the AIDS approach is that it includes an income effect, which is empirically very important. Unlike trade models relying on the CES specification, the FTA-CGE model can exhibit trade creation, with trade growing more rapidly than aggregate GDP, without major swings in relative international prices. The AIDS specification leads to more realistic trade-volume and terms-of-trade effects when analyzing the impact of expanded U.S.–Mexican trade under an FTA. The inclusion of income effects, however, is really only a first step. In the future, it is important to explore other modeling approaches which permit the analysis of market penetration in environments of product differentiation and imperfect competition.[50]

The FTA-CGE model, like other multi-country CGE models, has a medium to long-run focus. We assume, for example, that factor markets adjust. While sectoral employment changes, aggregate employment is assumed to remain unchanged. We report the results of a number of comparative statics experiments in which we "shock" the model by changing some exogenous variables and then compute the changed equilibrium solution. We do not explicitly consider how long it might take the economy to reach the new equilibrium. The model's time horizon has to be viewed as "long enough" for full adjustment to occur, given the shock. While useful to understand the pushes and pulls the two economies will face under the creation of an FTA, this approach has obvious shortcomings. In particular, it does not consider the costs of adjustment, such as transitional unemployment, that might occur while moving to the final equilibrium.

Modeling the transition process is difficult and requires a different approach than modeling comparative statics equilibria. There are a number of examples of single-country CGE models which have modeled dynamic adjustments over a period of years in one or two-year jumps.[51] The U.S.–Mexico CGE model developed by Hinojosa and McCleery (1991) takes this approach. One multisector model of the U.S. and Mexico developed at the University of Maryland integrates dynamic input-output models with macroeconometric

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[49]Hanson, Robinson, and Tokarick (1989) use the AIDS function in their 30-sector single-country CGE model of the U.S. They estimate the sectoral import demand functions using time-series data and find that sectoral expenditure elasticities of import demand are generally much greater than one in the U.S., results consistent with estimates from macroeconometric models.

[50]There is active theoretical work on this approach that should lead to empirically implementable formulations. See Krugman (1989), Helpman and Krugman (1985), and Venables and Smith (1986). Devarajan and Rodrik (1989) discuss the potential importance of incorporating such factors into CGE models of developing countries. Harris (9185) and Cox and Harris (1985) incorporate imperfect competition into a CGE model of Canada. De Melo and Tarr (1990) have built a CGE model of the U.S. which incorporates imperfect competition to analyze the impact of trade policy with respect to steel, automobiles, and textiles.

[51]See Dervis, de Melo, and Robinson (1982) for a discussion of this adaptive approach to modeling dynamic processes with CGE models.

models of the two countries to explore the process of adjustment to the creation of an FTA.[52] This model is not a CGE model and uses an adaptive, disequilibrium adjustment model of price formation. However, it integrates macro features with the multisector model and provides a framework for analyzing the adjustment process over time. This approach is potentially complementary with the more neoclassical, medium-run, equilibrium approach provided by the multi-country CGE models.

The FTA-CGE model is "benchmarked" on 1988. The model data base consists of social accounting matrices (SAMs) for the two countries, including data on their trade flows.[53] The SAM starts from multisectoral input-output data, which are expanded to provide information on the circular flow of income from producers to factors to "institutions," which include households, enterprises, government, a capital account, and two trade accounts, one for the partner country and one for the rest of the world. These institutions represent the economic actors whose behavior and interactions are described in the CGE models.

The development of the data base is a major effort. For Mexico, we started from an input-output table for 1985, which was then projected forward to 1988 using data on macroeconomic aggregates and sectoral output and value added. A similar exercise was done for the U.S., starting from a 1986 input-output table.[54] The Mexican SAM used in the model is currently being refined and revised, although the changes should have little effect at the seven-sector level used in the current version of the model.

The parameter estimates for the sectoral production functions, consumer expenditure functions, import aggregation functions, and export transformation functions were drawn from a variety of sources. In the U.S, there has been a serious effort to estimate these parameters econometrically. We drew on recent work by Tarr (1989); de Melo and Tarr (1990); Shiells, Stern, and Deardorff (1986); Reinert and Shiells (1990); and Reinert and Roland-Holst (1990). On the Mexican side, we drew on Bueno (1974); Clavijo (1977); Peñaloza-Webb (1988); Salas (1988); Cohen (1989); and Interindustry Economic Research Fund (1990). Estimates of non-tariff protection rates are harder to find. The International Trade Commission has done some estimates for the U.S. [USITC(1989,1990)], as have Tarr

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[52]The model was done under a contract with the U.S. Department of Labor and is described in Interindustry Economic Research Fund (1990). The principal investigator on the project was Clopper Almon. For a different approach to modelling macro-sectoral linkages, see Just (1990), O'Mara (1990), and O'Mara and Verschoor (1990).

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

[54]The latest official input-output table for the U.S. is for 1977. A number of researchers, both inside and outside government, have used various projection techniques to update the 1977 table to 1982, 1986, and forward. Given the importance of input-output data for analyzing the impact of changes in international trade on the structure of production and the obvious need for such analysis as part of the trade negotiations under the Uruguay GATT round, it is astounding that the U.S. government has not yet released the official 1982 input-output table. At this point, while it would be helpful to release the 1982 table, major emphasis should be placed on developing and releasing the next U.S. input-output table (for 1987) quickly. In the Mexican case, the last official input-output table is for 1980, but a preliminary version for 1985 based mostly on an industrial census is available.

(1989) and de Melo and Tarr (1990). For non-tariff barriers in Mexico, we relied on estimates by Interindustry Economic Research Fund (1990) and USITC (1991).

The various parameters used in the model represent point estimates for the base year (1988) and the model was benchmarked so that its base equilibrium solution exactly replicates the base data. Many of the parameters are estimated by computing shares from the two SAMs. Using this procedure, it is generally impossible to estimate confidence intervals for the various parameters. While we drew on econometric studies, the model is certainly not analogous to a macroeconometric model whose parameters are all estimated simultaneously from a consistent data base. We have done some limited sensitivity analysis to see how robust our experimental results are to variations in parameter estimates and model specification, and we note the areas of particular sensitivity in discussing the experiment results.

4. Alternative Scenarios

Starting from the benchmark or base-run solution, we conducted a series of comparative-statics experiments to explore the impact of creating a U.S.–Mexico FTA. The experiments are summarized in Table 4. The first four experiments are cumulative, progressively adding changes to the base run. The intent is to isolate the relative importance of the different factors involved. In addition to tariff and non-tariff barriers, we consider four additional factors: productivity increases arising from lessening of barriers (sectoral distortions) that prevent the competitive movement of capital across sectors; increased investment in Mexico which causes it to grow relative to the U.S.; changes in the balance of trade, assumed to arise from debt relief or substantial increases in foreign investment in Mexico; and changes in the pattern of net migration between the two countries.

The first two experiments remove trade barriers under an FTA, assuming no other changes in either economy. Experiment 1 removes existing official tariffs, while Experiment 2, in addition, removes non-tariff barriers. The first two experiments are close in spirit to the scenario portrayed in the ITC model, as well as the first scenario in the KPMG study.

Experiments 3 and 4 add beneficial effects that empirical work indicates are often associated with the shift to a more open development strategy. Experiment 3 postulates an increase in productivity due to pro-competitive changes in the allocation of capital across sectors. The effect is modelled by lowering the "factor distortion" parameter for capital by ten percent in the light manufacturing, intermediates, and capital goods sectors. The resulting increases in aggregate productivity are relatively small compared to observed changes in total factor productivity in countries which have successfully moved to an open development strategy.[55] The results should thus be seen as a lower bound on the potential

[55]See, for example, Chenery, Robinson, and Syrquin (1986), chapters 2, 8, 9, and 10. De Melo and Robinson (1990) construct a stylized CGE model of Korea which links total factor productivity growth to export performance, and manage to replicate the major empirical features of Korean growth. The productivity link postulated in the FTA-CGE model is more conservative, relying only on lessening

Table 4: List of Experiments

No.	Experiment name	Description
1.	Tariff removal	Remove all official tariffs.
2.	Trade liberalization	Tariff removal experiment plus removal of all quantity restrictions on imports.
3.	Pro-competitive trade liberalization	Trade liberalization experiment plus capital reallocation due to lower distortions in domestic capital markets in the U.S. and Mexico in light manufacturing (LM), intermediates (IN), and consumer durables (CD).
4a.	Mexican growth	Pro-competitive trade liberalization experiment plus increased aggregate capital stock in Mexico (7.6%). No return migration.
5a.	Mexican Transition	Modified Mexican growth experiment, with half the increase in aggregate capital stock (3.8%), plus increased foreign borrowing by Mexico. No return migration.
4b.	Growth and migration	Mexican growth experiment plus return migration to Mexico.
5b.	Transition and migration	Modified Mexican transition experiment plus return migration to Mexico.

improvements in productivity that could be generated by a successful change in Mexican development strategy.

Experiment 4 represents an equilibrium in which the Mexican capital stock is bigger, productivity in both countries is higher, and all import protection between the two countries is removed (although barriers to imports from the rest of the world to both countries are left unchanged). The capital stock increase assumed in Experiment 4 is drawn from a similar scenario used in the KPMG model [KPMG (1991)]. They assume a $25 billion increase in the Mexican capital stock, which represents 7.6 percent of the initial capital stock. In the KPMG model, this amount is sufficient to lower the average rental rate of capital to its pre-FTA value. In Experiment 4, the balance of trade is not changed from its value in the base run.[56] The implicit assumption is that increased foreign capital inflows have led to an increase in the capital stock, but at the final equilibrium the balance of trade is again in surplus, as the economy moves to repay the earlier foreign borrowing.

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capital market distortions.

[56]In the KPMG scenario, they assume that a large part of the required increased investment comes from foreign sources. As part of the experiment, they assume that the balance of trade moves further into surplus, as Mexico is required to repay the increased foreign borrowing.

In Experiment 5, we are portraying an intermediate point, where the capital stock is increased by half the amount (3.8 percent), and Mexico is assumed to generate a trade deficit of $5 billion, which represents a $7.8 swing from the base-run surplus of $2.8 billion. The U.S. absorbs $4.7 billion of the $7.8 billion swing. The idea behind Experiment 5 is to portray a typical transition year, in which Mexico is growing relative to the U.S. and is also running a trade deficit, which permits an increase in imports. The difference in the trade balance leads to significant differences in the real exchange rate and in the sectoral structure of trade.

The differences between Experiments 4a and 4b, and 5a and 5b, concern assumptions about the level of net migration. In the "a" version, the level of net migration is set to zero. In the "b" version, migration is determined endogenously, with labor flowing between the two countries to maintain the relative ratios between U.S. and Mexican wages of rural and unskilled urban labor observed in the base run. These experiments indicate the importance of migration, with the "b" versions generating back migration, as Mexico grows relative to the U.S. Note that the back migration arises from the comparative statics nature of the experiments — there is no change in the size of the labor force in the two countries. The experiments indicate the relative direction of migration pressure, and certainly do not represent a prediction of what would actually happen in a dynamic setting with uneven demographic trends in the two countries.

The results from the experiments are presented in Tables 5 to 16. Tables 10 to 16 provide detailed information on changes in sectoral output and trade structure. Tables 5 to 9 provide aggregate information. Table 5 presents macro aggregates and the real exchange rate. Table 6 provides a decomposition of the change in aggregate absorption due to the experiment. Aggregate absorption is defined as the total demand for goods and services in an economy and equals production (Gross Domestic Product, or GDP) plus imports minus exports. In a static model, it is a measure of aggregate welfare. The decomposition methodology we use is described in Dervis, de Melo, and Robinson (1982), chapter 7. Table 6 indicates the contribution to the total change in absorption of changes in production (GDP), international prices (the terms of trade), domestic relative prices, and the balance of trade. Tables 7 to 9 provide data on trade, wages, and migration.

Table 5: Aggregate Results

	Ratios (%) to base-run value:						
	Experiment 1	Experiment 2	Experiment 3	Experiment 4a	Experiment 4b	Experiment 5a	Experiment 5b
	Tariff removal	Trade liberalization	Pro-competitive	Mexican growth	Mexican transition	Growth and migration	Transition and migration
Mexico							
Real GDP	0.1	0.3	1.2	6.4	3.0	6.8	4.5
Real exports	2.4	4.7	6.4	13.4	-9.0	14.0	-7.2
Real imports	1.5	6.0	8.1	11.8	28.6	11.9	28.9
Labor force	-0.1	0.3	1.0	0.1	0.1	1.4	5.0
Capital stock	0.0	0.0	0.0	7.6	3.8	7.6	3.8
Exchange rate	0.8	-0.6	-1.8	1.8	-16.2	2.3	-14.4
United States							
Real GDP	0.1	0.0	0.1	0.1	0.1	0.1	-0.2
Real exports	0.0	-2.1	-2.0	-1.9	-1.2	-2.0	-1.7
Real imports	0.0	-0.3	-0.2	0.1	-0.6	0.0	-0.9
Labor force	0.2	-0.1	-0.2	0.0	0.0	-0.3	-1.0
Capital stock	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exchange rate	0.0	0.0	-0.6	-0.5	-0.5	-0.6	-0.7

Notes: Real magnitudes are in base-run (1988) prices for each country. The consumer price indices in the U.S. and Mexico are fixed at their base-run values (by choice of numeraire in the model). The change in the exchange rate represents a depreciation or appreciation of the real price-level deflated (PLD) exchange rate, using the consumer price index as deflator.

Table 6: Decomposition of Change in Aggregate Absorption

Experiment	Change in aggregate absorption from base-run (billion $ or trillion pesos)		Decomposition of change in aggregate absorption:							
			Production (GDP) effect		Terms of trade effect		Relative price effect		Balance of trade effect	
	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico
1. Tariff removal	0.57	-0.03	0.40	.05	0.05	-0.11	0.12	0.03	0.00	0.00
2. Trade liberalization	-1.18	1.61	-0.92	0.51	-0.38	0.87	0.13	0.24	0.00	0.00
3. Pro-competitive	0.87	5.22	1.46	3.90	-0.40	0.90	-0.19	0.42	0.00	0.00
4a. Mexican growth	4.57	23.57	4.23	23.89	0.48	-1.09	-0.14	0.78	0.00	0.00
5a. Mexican transition	-1.36	30.36	4.65	10.36	-0.69	1.56	-0.64	0.94	-4.68	17.50
4b. Growth and migration	0.78	25.03	0.37	25.55	0.58	-1.32	-0.18	0.79	0.00	0.00
5b. Transition and migration	-17.05	35.91	-11.29	16.50	-0.33	0.75	-0.75	1.16	-4.68	17.50

Notes: The decomposition methodology is described in Dervis, de Melo, and Robinson (1982), Chapter 7. We use the Laspeyres version of the various indices, which uses base-year price weights, so that real GDP changes are defined in the standard way. Real absorption is defined as total production (GDP) plus imports minus exports. The "production" effect is due to a change in aggregate production, or a shift of the production possibility frontier. The "terms of trade" effect refers to changes in international prices. The "relative price" effect refers to movements along the economy's production possibility frontier due to changes in relative prices as distortionary price wedges are changed. The "balance of trade" effect is due to changes in the aggregate trade balance.

Table 7: Changes in Aggregate Trade Flows

Experiment	Country	Change in trade values from base-run value: (billions of world $) Exports to: partner	Exports to: rest of world	Imports from: partner	Imports from: rest of world	Balance of trade
1. Tariff removal						
	U.S.	0.77	0.01	0.61	0.17	0.00
	Mexico	0.61	0.10	0.77	-0.06	0.00
2. Trade liberalization						
	U.S.	2.03	0.15	2.17	0.01	0.00
	Mexico	2.17	-0.08	2.03	0.06	0.00
3. Pro-competitive						
	U.S.	2.30	0.28	2.45	0.13	0.00
	Mexico	2.45	0.13	2.30	0.28	0.00
4a. Mexican growth						
	U.S.	2.83	0.51	2.76	0.58	0.00
	Mexico	2.76	0.80	2.83	0.73	0.00
5a. Mexican transition						
	U.S.	5.31	1.14	1.71	0.04	-4.70
	Mexico	1.71	-1.47	5.31	2.70	7.77
5b. Growth and migration						
	U.S.	2.86	0.09	2.75	0.20	0.00
	Mexico	2.75	0.86	2.86	0.75	0.00
5b. Transition and migration						
	U.S.	5.37	-0.54	1.67	-1.54	-4.70
	Mexico	1.67	-1.32	5.37	2.75	7.77

Notes: Exports, imports, and balance of trade of goods and non-factor services in billions of 1988 world dollars.

Table 8: Changes in Wage Rates

Experiment		Changes (%) in Wage Rates from base-run values: Rural Workers	Urban Unskilled	Skilled Workers	White Collar	Capital (rental)
1. Tariff removal						
	U.S.	-0.1	-0.1	0.0	0.0	0.0
	Mexico	0.7	0.7	0.3	0.2	-0.4
2. Trade liberalization						
	U.S.	0.3	0.4	0.0	0.0	0.0
	Mexico	-0.2	-0.2	1.0	1.0	1.1
3. Pro-competitive						
	U.S.	1.5	1.5	0.1	0.2	1.1
	Mexico	0.2	0.2	2.6	3.5	2.5
4a. Mexican growth						
	U.S.	-0.4	0.7	0.1	0.3	1.2
	Mexico	9.2	9.2	7.4	8.8	-1.2
5a. Mexican transition						
	U.S.	-0.2	0.6	0.1	0.3	1.1
	Mexico	6.7	6.7	4.6	6.4	2.1
4b. Growth and migration						
	U.S.	1.8	1.8	0.0	0.2	1.1
	Mexico	4.7	4.7	7.7	9.1	-0.9
5b. Transition and migration						
	U.S.	5.7	5.7	-0.2	0.0	0.8
	Mexico	-8.7	-8.7	5.9	7.5	3.1

Notes: The "wage" rate for capital is the gross rental rate, which equals sectoral property (non-labor) income divided by the value of the capital stock in base-year prices.

Table 9: Net Changes in Migration

(thousands of workers) Experiment	Rural Workers: Mexican Ag. to U.S. Ag	Urban Workers: Mexico to U.S.	Rural Workers: Mexico Ag.to Mexico Urban
1. Tariff removal	-18	75	76
2. Trade liberalization	-25	-16	36
3. Pro-competitive	-28	-165	-60
4a. Mexican growth	0	0	-18
5a. Mexican transition	0	0	9
4b. Growth and migration	-33	-229	-113
5b. Transition and migration	-87	-969	-417

Table 10
Experiment 1: Tariff Removal

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.0	5.7	0.0	1.8	0.2
OL	0.0	-0.1	0.0	0.4	0.0
LM	0.0	12.6	0.0	9.4	0.0
IN	0.0	3.1	0.0	4.4	0.1
CD	0.1	7.5	0.1	4.2	0.0
KG	0.0	2.1	0.0	3.5	0.0
SE	0.0	3.8	0.0	0.5	0.0

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	-0.1	1.8	1.9	5.7	0.3
OL	0.0	0.4	-0.1	-0.1	-0.1
LM	0.1	9.4	1.7	12.6	0.3
IN	0.4	4.4	1.9	3.1	-0.2
CD	1.3	4.2	3.6	7.5	-3.7
KG	0.2	3.5	1.9	2.1	-0.4
SE	-0.1	0.5	0.5	3.8	-0.3

Table 11
Experiment 2: Trade Liberalization

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	-0.1	19.0	-0.1	11.0	0.7
OL	0.0	0.3	0.1	0.1	-0.1
LM	0.0	20.3	0.0	21.8	0.0
IN	0.0	6.7	-0.1	11.9	0.3
CD	0.5	36.7	0.5	7.0	-0.2
KG	0.0	3.1	0.0	1.2	0.1
SE	0.0	9.3	-0.1	3.5	0.0

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	0.2	11.0	-2.6	19.0	4.6
OL	0.0	0.1	-1.0	0.3	0.4
LM	0.7	21.8	-0.8	20.3	3.7
IN	0.4	11.9	-1.1	6.7	1.7
CD	-2.6	7.0	-1.3	36.7	-8.3
KG	-1.0	1.2	-2.5	3.1	0.8
SE	0.1	3.5	-0.8	9.3	0.9

Table 12
Experiment 3: Competitive Trade Liberalization

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.3	26.4	-2.8	12.5	3.9
OL	0.0	1.5	-0.9	-0.4	0.4
LM	1.3	24.9	3.3	27.4	-1.4
IN	0.8	7.4	3.4	15.1	-1.1
CD	1.8	37.9	3.1	12.0	-0.4
KG	-0.6	4.6	-1.8	-0.6	1.5
SE	-0.1	10.1	-0.9	2.6	0.4

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	1.6	12.5	-9.1	26.4	11.9
OL	0.0	-0.4	-4.3	1.5	2.0
LM	4.5	27.4	7.1	24.9	8.1
IN	2.8	15.1	7.3	7.4	1.6
CD	2.1	12.0	7.8	37.9	-8.8
KG	-1.9	-0.6	-7.1	4.6	2.9
SE	0.1	2.6	-3.4	10.1	2.6

Table 13
Experiment 4a: Mexican Growth

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.5	39.2	-2.0	16.7	4.2
OL	0.0	6.0	-1.4	-3.2	0.6
LM	1.3	30.4	3.5	40.8	-1.4
IN	0.8	11.6	3.5	22.4	-0.9
CD	1.8	38.1	3.1	23.2	-0.3
KG	-0.6	5.7	-1.8	6.8	1.6
SE	-0.1	14.1	-0.8	5.6	0.5

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	7.9	16.7	6.1	39.2	23.9
OL	0.0	-3.2	-14.6	6.0	7.4
LM	12.1	40.8	25.2	30.4	15.0
IN	9.3	22.4	23.5	11.6	6.7
CD	13.1	23.2	29.0	38.1	-8.9
KG	3.5	6.8	6.8	5.7	4.3
SE	4.4	5.6	3.7	14.1	8.2

Table 14
Experiment 5a: Mexican Transition

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.7	61.9	-2.0	1.7	3.4
OL	0.0	5.8	-1.3	-3.1	0.5
LM	1.5	59.1	3.5	7.7	-1.6
IN	1.1	22.3	3.8	0.0	-1.0
CD	2.5	60.8	3.8	-16.2	-0.4
KG	-0.3	17.0	-1.5	-18.0	1.6
SE	-0.1	21.1	-0.9	-1.8	0.3

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	4.3	1.7	-41.8	61.9	47.0
OL	0.0	-3.1	-14.0	5.8	7.1
LM	8.4	7.7	-17.2	59.1	52.5
IN	-2.0	0.0	-22.6	22.3	20.1
CD	-20.4	-16.2	-36.6	60.8	20.8
KG	-9.9	-18.0	-36.0	17.0	17.8
SE	3.5	-1.8	-13.4	21.1	18.9

Table 15
Experiment 4b: Growth and Migration

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.2	39.5	-2.9	17.4	4.1
OL	0.0	6.4	-1.0	-3.5	0.4
LM	1.2	30.5	3.2	41.9	-1.4
IN	0.7	11.9	3.4	22.8	-1.0
CD	1.7	38.0	3.0	24.0	-0.4
KG	-0.6	5.8	-1.8	7.3	1.5
SE	-0.1	14.3	-1.0	5.9	0.4

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	8.5	17.4	9.2	39.5	24.3
OL	0.0	-3.5	-15.2	6.4	7.8
LM	12.6	41.9	26.8	30.5	15.2
IN	9.8	22.8	24.6	11.9	7.1
CD	13.9	24.0	30.7	38.0	-9.0
KG	3.9	7.3	7.7	5.8	4.4
SE	4.8	5.9	4.6	14.3	8.5

Table 16
Experiment 5b: Transition and Migration

Ratios (%) to base run values, U.S.

Sector	Output	Exports to: Mexico	Exports to: Rest of world	Imports from: Mexico	Imports from: Rest of world
AG	0.0	63.0	-4.6	3.9	3.0
OL	0.0	7.1	0.2	-4.2	-0.1
LM	1.0	58.8	2.7	11.5	-1.9
IN	0.8	23.1	3.3	1.5	-1.6
CD	2.3	59.8	3.4	-13.6	-0.7
KG	-0.5	17.0	-1.8	-16.4	1.4
SE	-0.5	21.8	-1.4	-0.6	-0.1

Ratios (%) to base run values, Mexico

Sector	Output	Exports to: U.S.	Exports to: Rest of world	Imports from: U.S.	Imports from: Rest of world
AG	6.6	3.9	-34.4	63.0	48.6
OL	0.0	-4.2	-16.1	7.1	8.4
LM	10.2	11.5	-12.6	58.8	52.7
IN	-0.5	1.5	-19.4	23.1	21.3
CD	-18.0	-13.6	-32.9	59.8	19.7
KG	-8.7	-16.4	-33.4	17.0	17.9
SE	5.0	-0.6	-10.2	21.8	20.3

Trade Liberalization

Experiments 1 and 2, which involve only removal of import barriers, have a relatively small effect on both economies. From Tables 5 and 6, the effects on aggregate GDP are small in both economies. From Table 7, there is a small increase in the value of U.S.–Mexican trade, with tariff removal yielding less than a billion dollar increase and complete liberalization yielding about $2 billion increase. From Tables 10 and 11, one can see some differences in sectoral impacts between the two experiments, with complete liberalization leading to differences in trade structure between the two countries. The sectoral percent increases in trade between the U.S. and Mexico are significant in Experiment 2. The effects on sectoral output in the U.S. are tiny in both experiments, while those for Mexico are noticeable, but still very small.

Consistent with the finding reported in the USITC (1990) study, tariff removal leads to a tiny (0.1 percent) fall in the wages of rural and urban unskilled workers in the U.S., and no change in other factor returns. Full trade liberalization, however, leads to a small (0.3–0.4 percent) rise in rural and unskilled urban wages in the U.S. The effects on Mexican wages are also small, but larger than in the U.S.

In the FTA-CGE model, in contrast to the ITC model, relative wages are affected by migration. Table 9 indicates that Experiments 1 and 2 generate some changes in migration, with a net flow to the U.S. in Experiment 1 and a small net outflow in Experiment 2. The wage results for the rural and unskilled labor categories are sensitive to these migration flows.

If Experiments 1 and 2 indicated all the aggregate changes that would arise due to the creation of an FTA, the exercise would hardly seem worth the trouble. The point to be made here is that the existing tariff and non-tariff trade barriers between the two countries are relatively small, and one would not expect large aggregate effects from removing them.[57] The major benefits from the creation of an FTA will come from effects which are likely linked to trade liberalization, but do not arise simply from changing relative prices. Trade liberalization should be seen as a necessary, but by no means sufficient, condition for achieving the potential benefits from the creation of an FTA.

Productivity, Investment, and Growth

Experiments 3 and 4 explore the impact of assuming some increase in sectoral productivity and an increase in Mexican growth relative to that in the U.S. These experiments generate more significant benefits to both countries. Trade volumes between the two countries increase by $2–3 billion (Table 7), which represents about a 20 percent increase over the base value (Table 2). The effect is far larger for Mexico, for which trade with the

[57]These results are consistent with many other studies with single-country and multi-country, trade-focused CGE models. For example, see Srinivasan and Whalley (1986) who collect a number of studies of the impact of a fifty percent cut in tariffs on a number of countries. The results are uniformly small, unless factors other than simply changes in relative prices are taken into account.

U.S. represents about half of its total imports and three fourths of its total exports. From Table 5, increasing trade with the U.S. generates a terms-of-trade loss for Mexico, as it expands exports to the U.S. market. The effect, however, is small, and is swamped by the beneficial production effect (+23.89 trillion pesos, compared to the –1.09 trillion terms-of-trade effect).[58]

Experiment 4a indicates that increased Mexican growth benefits the U.S. economy, as well as Mexico. Real absorption and production rise in both countries (Tables 5 and 6), as do wages of all labor categories except rural workers in the U.S. (Table 8). With migration (Experiment 4b), all wages increase. The aggregate effect on the U.S. is small — the production increase represents about a tenth of a percent of initial GDP. However, relative to the change in trade volumes with Mexico, the increase is significant and certainly justifies the effort of creating the FTA and adjusting the structure of production to take advantage of the new opportunities.

The sectoral changes (Tables 12 and 13) are more significant, with large percent changes (from small bases) of trade with Mexico. For Mexico, the changes in the sectoral structure of production are quite large, with large increases in light manufacturing (LM) and consumer durables (CD) relative to the agricultural (AG), capital goods (KG), and service (SE) sectors. The new development strategy involves rapid growth in manufacturing exports, although note that there are also increases in imports from the U.S. as well (Table 13). In the base year, Mexico has a trade surplus in all sectors except capital goods. Liberalization leads to changes in the structure of trade, but all sectors except capital goods still have a trade surplus. For the U.S., rapid export growth takes place in agriculture, consumer durables, and light manufacturing.

The effect of migration is significant. The migration equations solve for migration levels which achieve a specified ratio of the wages in a common currency across the two countries in the rural and urban unskilled labor categories. Migration is thus very sensitive to changes in the exchange rate. In Experiment 4b, from Table 5, there is a net devaluation of the U.S. relative to Mexico of 2.9 percent, which would tend to raise the Mexican wage relative to the U.S., in a common currency. The net effect is migration of 262 thousand workers back to Mexico, a smaller increase in the real wages of the two labor categories in Mexico, and a larger increase in the U.S., relative to Experiment 4a.

The out-migration leads to smaller increases in the wages of unskilled and white collar workers in the U.S., compared to Experiment 4a. The effect is very small, but the result is consistent with standard trade theory. In the U.S., skilled and white collar workers become relatively abundant as the unskilled labor force shrinks, and their wages thus fall relatively. In the model, with segmented labor markets, the effect is to narrow the gap between skilled and unskilled wages. In fact, one might expect to observe a mix of wage narrowing and movement of labor across the two skill categories (e.g., union members leaving the organized sector as unorganized wages rise).

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[58]In the model, the small terms-of-trade effect arises from the fact that expenditure elasticities of import demand are generally larger than one. There is a trade-creation effect, with the volume of trade growing faster than aggregate output, without major changes in relative prices.

Mexican Transition to the New Strategy

Experiment 5a, the transition experiment, represents a half-way point, with the Mexican capital stock 3.8 percent higher, compared to 7.6 percent in Experiment 4a. The assumed increased foreign capital inflow leads to an appreciation of the Mexican real exchange rate of 16.2 percent (Table 5). In this comparative statics experiment, the appreciation leads to a significant decline in real exports and an increase in imports, relative to the base run. In a comparative dynamic setting, the effect would be to reduce the rate of growth of exports relative to a dynamic base run. The comparative statics experiment, however, emphasizes a real effect. Increased foreign capital inflows lead to an appreciation of the real exchange rate and a relative shift in incentives against exporting.

Assuming the need to import capital goods and intermediates to fuel the technological transformation necessary for the transition, policymakers must expect increases in Mexican imports and a temporary slowing of export growth. The danger, however, is that producers will view the appreciation of the real exchange rate as a signal that Mexico is returning to its old strategy. It is important that the shift in strategy be seen as permanent, so that producers will correctly see that long-run incentives will favor exporting.

Countries such as Korea, Taiwan, and Turkey shifted development strategies starting from a position of high levels of import protection and extreme bias in incentives against exporting. When they reduced protection and removed the large incentive bias, exports increased, even though there were simultaneous increases in foreign capital inflows.[59] Mexico, on the other hand, is starting from a position of low import protection and trade surpluses. If the FTA is formed, producers must see that the new environment is permanent and that Mexico will not be able to return to the environment of the 1970s, where high trade deficits were accompanied by high levels of protection for import substitution. Under an FTA, exporters will be free to purchase imports and sell output at world prices, which are the crucial features of an open development strategy.

The transition experiments indicate the importance of capital inflows in affecting welfare. In Experiment 5a, Table 6 indicates that absorption in the U.S. falls by $1.36 billion, even though GDP rises by $4.65 billion. The reason has nothing to do with the formation of the FTA, but is due to the assumed reduction in the U.S. deficit in the balance of trade, which requires a cut in aggregate absorption (or expenditure). The balance-of-trade effect reduces absorption by $4.68 billion in both Experiments 5a and 5b. Managing expenditure reduction as the country moves to return to its historic pattern of trade surplus is a new problem for U.S. policymakers. Eliminating the current deficit of over a hundred billion dollars will require corresponding expenditure reduction, including reduction in real incomes.

[59]In all these countries, there were also significant subsidies to exporting during the transition to an open development strategy. Mexico, as a GATT member, cannot subsidize non-agricultural exports, even if it so desired.

For Mexico, there is a potential structural adjustment problem in starting the transition process in the context of an FTA. Comparing Experiments 4a and 5a, there is a dramatic difference in the performance of the consumer durables sector. In 4a, consumer durables output increases by 13.1 percent, and exports increase by 23.2 percent to the U.S. and 29.0 percent to the rest of the world. In 5a, however, output falls by 20.4 percent, with associated falls in exports and increases in imports. This sector appears to be very sensitive to changes in the real exchange rate, and the shift from the transition deficit phase to the final surplus phase will involve significant structural change and reallocation of resources.[60]

The experiments indicate a potential problem area for Mexican policymakers in managing the transition. The comparative statics experiments, of course, overstate the difference between the two phases. In a dynamic setting, producers are not so myopic and will invest in anticipation of the change to the surplus phase. The results do indicate again the need to give producers a consistent set of signals so that they can correctly anticipate that the shift in development strategy will be lasting.

Experiment 5b replicates 5a, but adds the migration equations. Without migration, the large appreciation of the Mexican real exchange rate would lead to a narrowing of wage differentials between the two countries in a common currency. To maintain the differential, the model generates significant back migration from the U.S. to Mexico. The effect is dramatic. In the experiment, a million workers return to Mexico, driving down the Mexican real wage for rural and urban unskilled workers by 8.7 percent. The converse occurs in the U.S., with real wages of the two categories rising by 5.7 percent.[61] The effect on the other labor categories is the net result of two forces. First, skilled and white collar workers are relatively more abundant, so their relative wage should fall. Second, aggregate income falls as the economy loses labor. From Tables 5 and 6, the U.S. aggregate labor force falls by 1.0 percent, leading to a fall in real GDP of -0.2 percent, or 11 billion dollars. The net effect is that skilled wages fall slightly (down 0.2 percent) and white collar wages remain unchanged.

The results from Experiment 5b point up a weakness in the assumed migration behavior. In the model, migration ensures that relative wages across the border, measured in a common currency, remain fixed. Real wages in the two countries measured in domestic currency, however, grow at different rates. In Experiment 5b, the net result is that migrants move from a labor market where real wages are rising to a labor market in which they are falling. The issue is in the specification of what motivates migrants. For example, if they are motivated by the desire to accumulate savings which they intend to repatriate, then migration will be sensitive to changes in the exchange rate. On the other hand, if they are motivated by observations on relative changes within the two economies ("life is getting better in the U.S., while in Mexico wages are falling"), then one would expect migration to be insensitive to changes in the exchange rate. The model probably overstates the sensitivity,

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[60]The consumer durables sectors is a heterogeneous aggregation of sectors, and these results point up the need to disaggregate it in order to explore the sensitivity of different subsectors to changes in the exchange rate.

[61]Note that the swing in relative real wages is 14.4% = 8.7% + 5.7%, which exactly equals the real appreciation (Table 5).

generating an unrealistically high level of back migration when the Mexican exchange rate appreciates.

The two sets of migration assumptions in the "a" and "b" experiments represent extremes and should bracket actual behavior. What can safely be concluded from the results is that the formation of an FTA will generate pressure for back migration or, in a dynamic setting, for reduced migration. In addition, they indicate that migrants are good for the U.S. economy. The larger labor force generates a higher level of GDP and results in higher wages for the more skilled labor categories, skilled and white collar workers. While consistent with trade theory, these spillover effects into other labor markets are quite small. The model neglects potential dynamic countervailing forces such as induced changes in technology to economize on the use of scarce factors, which might easily offset the spillover effects in the medium run.

5. Conclusion

A robust result from our empirical analysis is that the creation of a free trade area (FTA) between Mexico and the U.S. can significantly benefit both countries, if it is accompanied by other policies than enable Mexico to shift to an open development strategy and achieve renewed growth based on increased trade with the U.S. The success of an open development strategy, however, depends on many factors. The creation of an FTA is a necessary part of Mexico's policy shift, but will not by itself suffice to guarantee success. While Mexico stands to gain relatively more than the U.S., given the relative importance of the FTA to the two economies, the downside risk for Mexico is also great. If it fails to achieve the transition to a new development strategy, it faces further economic stagnation, with increasing political and social unrest. The short-term downside economic risk for the U.S. is very small since our empirical results indicate that the impact of the creation of an FTA on the U.S. economy, assuming no other changes in Mexico, is tiny. In the longer run, however, if Mexico fails to achieve a transition to an open development strategy, the economic risks for the U.S. are greater.

The three-country, seven-sector, computable general equilibrium (CGE) model we have developed has proved useful in analyzing the impact of the creation of an FTA on the two economies. The FTA-CGE model, however, is highly stylized and our empirical results indicate a number of steps that could be taken to improve the model and make it more relevant for policy analysis. First, comparative statics experiments indicate that the transition period in Mexico, when the country can borrow to finance increased imports, will yield a very different structure of incentives than the final phase, when Mexico returns to a balance of trade surplus. The analysis indicates the limitations of comparative statics and the need to model the dynamic behavior of the Mexican economy during the transition phase.

Second, the results for certain sectors (in particular, consumer durables) are very sensitive to changes in relative prices and the real exchange rate. The results indicate the need to disaggregate the model further in order to analyze the structural impact of policy changes in more detail. The high level of aggregation also prevents the specification of policies which operate on specific sectors. For example, agricultural policies operate very differently in various subsectors (e.g., corn, wheat, dairy, and meat). Related to aggregation

issues, another area of improvement is to specify the institutional structure of markets more realistically. For example, there is evidence of imperfect competition in a number of sectors in both economies. It is feasible to capture imperfect competition in the model, but it requires further disaggregation.

Third, the model only incorporates a few of the potential factors affecting economic performance when Mexico shifts development strategy. Issues of economies of scale, technology transfer through exporting and importing, and productivity gains through pro-competitive trade policies are feasible to model. Policy interactions among important actors in the economy involve political as well as economic relations, with distributional results being at least as relevant as aggregate performance. The difficulty is partly in modelling the linkages and partly in estimating the various parameters required to implement the features in a model. In these areas, empirical modelling is working close to the theoretical frontiers. In many cases, there is only limited theoretical guidance on specifying functional forms, let alone econometric estimates of relevant parameters.

Finally, it is worth noting that, in analyzing the impact of a comprehensive change in policy, it is usually worthwhile to use a variety of approaches. In terms of aggregation, CGE models represent a "mezzo" approach, falling between detailed micro studies of particular industries and macro models which focus on broad aggregates. Their strength is in capturing general equilibrium linkages that work through the operation of markets in the medium to long run. Micro and macro studies are potentially complementary, focusing on somewhat different issues.

Using models to analyze the economic consequences of establishing a U.S.–Mexico FTA is fraught with difficulties. Policymakers are never satisfied, economic advisors rarely make unconditional recommendations, and academic economists talk constantly of assumptions and caveats. Our preliminary work indicates that multi-country CGE models can provide a useful framework for analyzing important links between policy changes and economic performance. Our FTA-CGE model incorporates some advances in the state of the art in trade modelling, but our results also indicate that there is much yet to be done and many possibilities for improvement in the modelling framework.

Appendix: Sector Aggregation and Labor Categories

Sector Definitions:

FTA-CGE Sectors	Description	Sectoral Classification	
		Mexico	**U. S.**
Agriculture (AG)	Agricultural tradables Fruits and vegetables	1-4,18	1-19,60
Oil and Refining (OL)	Oil and fuels	6,33-34,	23
Light Manufacturing (LM)	Food processing Textiles and apparel Wood products Paper products	11-17, 19-32	30-54,62-63
Intermediates (IN)	Chemicals Nonmetal products Metal products Mining	5,7-10, 35-47	20-22,24-25, 55-59,61,64-69
Consumer Durables (CD)	Consumer durable manufacturing	48,53-54, 56-57	84-86,88, 94-95,100
Capital Goods (KG)	Capital goods manufacturing	49-52,55, 58-59	29,70-83, 87,89-93, 96-99
Services (SE)	Construction Electricity Commerce Transportation and communication Finance and real estate Services	60-72	26-28,101-121

Note: Mexico sector numbers come from the INEGI, Sistema de Cuentas Nacionales, 1985. Sector numbers for the U.S. are from a 121 sector input-output data base maintained by the Economic Research Service, U.S. Department of Agriculture.

Labor Categories:

FTA-CGE Employment Categories	Occupational Category
Rural labor:	Farm laborers
Urban unskilled labor:	Non-farm laborers Service
Skilled labor:	Craft Operatives Sales Clerical/administrative
White collar workers:	Officials and managers Professionals

Note: Occupational categories based on the U.S. Census single digit classification scheme. See Carnoy, Daley, and Hinojosa (1990). For Mexico, occupational classifications are drawn from Secretaria de Programacion y Presupuesto (1977), Censo Industrial.

References

Adelman, Irma and J. Edward Taylor (1990). "Is Adjustment with a Human Face Possible? The Case of Mexico." Journal of Development Studies, Vol. 26, No. 3 (April), pp. 387-407.

AFL-CIO (1991). U.S.-Mexico Free Trade Negotiations Talking Points: Full Debate, No Fast Track, Fair Trade. Washington, D.C.: AFL-CIO.

Allston, Julian M., Colin A. Carter, Richard Green, and Daniel Pick (1990). "Whither Armington Trade Models?" American Journal of Agricultural Economics, Vol. 72, No. 2 (May), pp. 455-467.

Armington, Paul S. (1969). "A Theory of Demand for Products Distinguished by Place of Production." IMF Staff Papers, Vol. 16, pp. 159-176.

Balassa, Bela (1989). "Outward Orientation." In H. Chenery and T.N. Srinivasan, eds., Handbook of Development Economics, Volume 2. Amsterdam: North-Holland.

Brooke, Anthony, David Kendrick, and Alexander Meeraus (1988). GAMS: A User's Guide. Redwood, Cal.: The Scientific Press.

Brown, Drusilla K. (1987). "Tariffs, the Terms of trade, and Natural Product Differentiation." Journal of Policy Modeling, (Autumn), pp. 503-526.

Brown, Drusilla K. and Robert M. Stern (1989). "Computable General Equilibrium Estimates of the Gains from U.S.-Canadian Trade Liberalization." In D. Greenway, T. Hyclak, and R.J. Thornton, eds., Economic Aspects of Regional Trading Arrangements. New York: New York University Press.

Bueno, Gerando (1974). "La paridad del poder adquisitivo y las eslasticidades de importacion y exportacion en Mexico." El Trimestre Economico, Vol. 41, No. 2.

Burniaux, Jean-Marc and Dominique van der Mensbrugghe (1990). "The RUNS Model: A Rural-Urban North-South General Equilibrium Model for Agricultural Policy Analysis." Technical Paper No. 33, OECD Development Centre, Paris.

Cardenas, Cuauhtemoc (1991). "The Continental Development and Trade Initiative." Statement delivered in New York City, February 8, 1991.

Carnoy, Martin, Hugh Daley and Raul Hinojosa-Ojeda (1990). Latinos in a Changing U.S. Economy: Comparative Perspectives on the U.S. Labor Market Since 1939. New York: IUP/CUNY.

Chenery, Hollis, Sherman Robinson, and Moshe Syrquin (1986). Industrialization and Growth: A Comparative Study. Oxford: Oxford University Press.

Calvijo, Fernando (1977). "El desequlibrio externo y la devaluacion en la economia mexicana." Trimenstre Economico Vol. 44, No. 1.

Cohen, Aslan (1989). "Trade policy in Mexico: an analysis of structural change." Ph.D. dissertation, Economics Department, University of California, Berkeley.

Corbo, Vittorio, Anne O. Krueger, and Fernando Ossa, eds. (1985). Export-Oriented Development Strategies: The Success of Five Newly Industrializing Countries. Boulder, Colorado: Westview Press.

Coughlin, Cletus C. (1990). "What Do Economic Models Tell Us About the Effects of the U.S.-Canada Free Trade Agreement?" Review, The Federal Reserve Bank of St. Louis, Vol. 72, No. 5 (September/October), pp. 40-58.

Cox, D. and R. Harris (1985). "Trade Liberalization and Industrial Organization: Some Estimates for Canada." Journal of Political Economy, Vol. 93, No. 1, pp. 115-45.

Dehesa, Mario (1982). "Tipos de empresa y el comercio exterior de manufactura." Economia Mexicana, No. 4.

Dervis, Kemal, Jaime de Melo, and Sherman Robinson (1982). General Equilibrium Models for Development Policy. Cambridge: Cambridge University Press.

Devarajan, Shantayanan and D. Rodrik (1989). "Trade Liberalization in Developing Countries: Do Imperfect Competition and Scale Economies Matter?" American Economic Review, May.

Devarajan, Shantayanan, Jeffrey D. Lewis, and Sherman Robinson (1990). "Policy Lessons from Trade-Focused, Two-Sector Models." Journal of Policy Modeling, Vol. 12, No. 4, pp.1-33.

Devarajan, Shantayanan, Jeffrey D. Lewis, and Sherman Robinson (1991). "External Shocks, Purchasing Power Parity, and the Equilibrium Real Exchange Rate." Working Paper, Department of Agricultural and Resource Economics, University of California at Berkeley.

Dickens, William T. and Kevin Lang (1988). "Why it Matters What We Trade." In W. Dickens *et al.*, eds., The Dynamics of Trade and Employment. Cambridge: MIT Press.

Espinoza de loes Reyes, Jorge (1951). Relaciones Economicas entre Mexico y Estados Unidos. Mexico. D.F.: Nacional Financiera.

Garcia y Griego, Manuel (1989). "The Mexican Labor Supply, 1990-2010" in Wayne A. Cornelius and Jorge A. Bustamante, eds., Mexican Migration to the United States: Origins, Consequences, and Policy Options. San Diego, Cailf.: Center for U.S.-Mexican Studies, University of California, San Diego.

Gilpin, Robert (1987). The Political Economy of International Relations. Princeton: Princeton University Press.

Goldin, Ian and Odin Knudsen, eds. (1990). Agricultural Trade Liberalization: Implications for Developing Countries. Paris: OECD, and Washington, D.C.: The World Bank.

Hanson, Kenneth, Sherman Robinson, and Stephen Tokarick (1989). "United States Adjustment in the 1990's: A CGE Analysis of Alternative Trade Strategies." Working Paper No. 510, Department of Agricultural and Resource Economics, University of California, Berkeley.

Harris, Richard (1985). "Applied General Equilibrium Analyses of Small Open Economies with Scale Economies and Imperfect Competition." American Economic Review, Vol. 74, No. 5, pp. 1017-1032.

Hayes-Bautista, David, Werner O. Schink, and Jorge Chapa (1988). The Burden of Support: Young Latinos in an Aging Society. Stanford, Calif.: Stanford University Press.

Helpman, Elhanan and Paul R. Krugman (1985). Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy. Cambridge: MIT Press.

Hinojosa-Ojeda, Raul (1989). The Political Economy of North-South Interdependence: Debt, Trade and Class Relations Across Mexico and the United States. Chicago, Ill.: Ph.D. Dissertation, Department of Political Science, University of Chicago.

Hinojosa-Ojeda, Raul (1991). "Research Report on the U.S.-Mexico FTA Negotiations: State Structures, Private Sector Influence and Asymmetrical Multi-Level Games." Processed, Institute for International Studies, University of California, Berkeley.

Hinojosa-Ojeda, Raul and Robert K. McCleery (1991). "U.S.-Mexico Interdependence, Social Pacts and Policy Alternatives: A Computable General Equilibrium Approach." Working Paper No. 596, Department of Agricultural and Resource Economics, University of California at Berkeley. Version in Spanish in Estudios Economicos, Vol. 5, No. 2., 1990.

Hinojosa-Ojeda, Raul and Rebecca Morales (1991, forthcoming). "International Restructuring and Labor Market Interdependence: The Automobile Industry in Mexico and the United States" in C.W. Reynolds, R. Hinojosa Ojeda, and J. Bustamante, eds. U.S.-Mexico Relations: Labor Market Interdependence. Stanford, Calif.: Stanford University Press.

Instituto Nacional de Estadistica Geografia e Informatica y Consejo Nacional de Poblacion,(1985) Proyecciones de la Poblacion de Mexico y de las Entidades Feceralivas: 1980-2010. Mexico City: INEGI-CONAPO.

Interindustry Economic Research Fund, Inc. (1990). "Industrial Effects of a Free Trade Agreement Between Mexico and the USA." Report for the United States Department of Labor prepared by the Interindustry Economic Research Fund, Inc., College Park, MD.

Johnston, William (1987). Workforce 2000: Work and Workers for the Twenty-First Century. Indianapolis, Indiana: The Hudson Institute.

Just, Richard (1990). "Analyzing the Effects of U.S. Macroeconomic Policy on U.S. Agriculture Using the USAGMKTS Model." Working Paper No. WPS 449, Agricultural and Rural Development Department, The World Bank.

Katz, Lawrence F. and Lawrence H. Summers (1988). "Can Inter-Industry Wage Differentials Justify Strategic Trade Policy?" National Bureau of Economic Research (NBER), Conference paper (April).

KPMG Peat Marwick/Policy Economics Group (1991). The Effects of a Free Trade Agreement between the U.S. and Mexico: Executive Summary (Washington, D.C.: U.S. Council of the Mexico-U.S. Business Committee/Council of the Americas)

Krasner, Stephen D. (1989). "Interdependencia simple y obstaculos para la coperacion entre Mexico y Estados Unidos," in Blanca Torres, ed., Interdependencia: Un enfoque util para el analisis de las relaciones Mexico-Estados Unidos? Mexico: El Colegio de Mexico.

Krugman, P.R. (1989). "Industrial Organization and International Trade." In R. Schmalensee and R. Willig, eds., Handbook of Industrial Organization. Amsterdam: North-Holland, forthcoming.

Marglin, Stephen and Juliet B. Schor, eds. (1990). The Golden Age of Capitalism: Reinterpreting the Postwar Experience. New York: Oxford University Press.

Melo, Jaime de and Sherman Robinson (1989). "Product Differentiation and the Treatment of Foreign Trade in Computable General Equilibrium Models of Small Economies." Journal of International Economics, Vol. 27, Nos. 1-2 (August), 1989, pp. 47-67.

Melo, Jaime de and Sherman Robinson (1990). "Productivity and Externalities: Models of Export-Led Growth." Working Paper No. WPS 387, Country Economics Department, The World Bank.

Melo, Jaime de and David G. Tarr (1989). "A General Equilibrium Analysis of U.S. Foreign Trade Policy." World Bank, April, processed. MIT Press, forthcoming.

Morales, Rebecca (1983). "Transitional Labor: Undocumented Workers in the Los Angeles Automobile Industry." International Migration Review, 17 (Winter).

Nishimizu, Mieko and Sherman Robinson (1984). "Trade Policies and Productivity Change in Semi-Industrialized Countries." Journal of Development Economics, Vol. 16, Nos. 1-2 (September-October), pp. 177-206.

Nomura Research Institute (1990). On the Market Investment Perspectives, Vol. 4, No. 12 (December), pp. 48-51.

OECD (1990). Special Issue: Modelling the Effects of Agricultural Policies, OECD Economic Studies, No. 13 (Winter).

O'Mara, Gerald T. (1990). "Analyzing the Effects on U.S. Agricultural Policy on Mexican Agricultural Markets Using the MEXAGMKTS Model." Working Paper No. 447, Agriculture and Rural Development Department, The World Bank.

O'Mara, Gerald T. and Alfred Verschoor (1990). "Analyzing Macroeconomic Linkage between Mexico and the United States." Agricultural Policies Division, Agriculture and Rural Development Department, The World Bank.

Pastor, Robert A. and Jorge G. Castañeda (1989). Limits to Friendship: The United States and Mexico. New York: Vintage Books.

Penalosa-Webb, R. (1988). "Elasticidad de la demanda de las exportaciones: La experiencia Mexicana." Commercio Exterior, Vol. 38, No. 5, (may).

Piore, Michael and Charles Sabel (1984). The Second Industrial Divide Possibilities for Prosperity. New York: Basic Books.

Pyatt, Graham and Jeffery I. Round, eds. (1985). Social Accounting Matrices: A Basis for Planning. Washington, D.C.: The World Bank.

Reinert, Kenneth A. and David W. Roland-Holst (1990). "Disaggregated Armington Elasticities for the Mining and Manufacturing Sectors of the United States." International Trade Commission. Journal of Policy Modeling, forthcoming.

Reinert, Kenneth A. and Clinton R. Shiells (1991). "Trade Substitution Elasticities for Analysis of a North American Free Trade Area." Research Division, Office of Economics, U.S. International Trade Commission, January.

Reynolds, Clark W. (1970). The Mexican Economy: Twentieth Century Structure and Growth. New Haven: Yale University Press.

Reynolds, Clark W. (1983). " Labor Market Projections for the United States and Mexico and Their Relevance to Current Migration Controversies" in Carlos Vasquez and Manuel Garcia y Griego, eds., Mexico-U.S. Relations: Conflict and Convergence. Los Angeles: UCLA Latin America Center.

Reynolds, Clark W., and Carlos Tello, eds. (1983). U.S.-Mexico Relations: Economic and Social Aspects. Stanford, Calif.: Stanford University Press.

Reynolds, Clark W., Raul Hinojosa Ojeda, and Jorge A. Bustamante, eds. U.S.-Mexico Relations: Labor Market Interdependence. Stanford, Calif.: Stanford University Press.

Robinson, Sherman (1989). "Multisectoral Models." In H.B. Chenery and T.N. Srinivasan, eds., Handbook of Development Economics. Amsterdam: North-Holland.

Robinson, Sherman (1990). "Analyzing Agricultural Trade Liberalization with Single Country Computable General Equilibrium Models." In Goldin, I. and O. Knudsen, eds., Agricultural Trade Liberalization: Implications for Developing Countries. Paris: OECD, and Washington, D.C.: The World Bank.

Robinson, Sherman, Kenneth Hanson, and Maureen Kilkenny (1990). "The USDA/ERS Computable General Equilibrium (CGE) Model of the United States." Staff Report No. AGES 9049, Economic Research Service, U.S. Department of Agriculture.

Salas, Javier (1988). "Estimación de la función de importaciones para México: una revisión 1961:1986." En El trimestre económico, LV(4): 220.

Sewell, John W. and Stuart K. Tucker, eds. (1988). Growth, Exports and Jobs in a Changing World Economy — Agenda 1988. New Brunswick, N.J.: Transaction Books.

Shiells, Clint R., Richard M. Stern, and Alan V. Deardorff (1986). "Estimates of the Elasticities of Substitution Between Imports and Home goods for the United States." Weltwirtschaftliches Archiv, 122:33, pp. 497-519.

Shott, Jeffrey J., ed. (1990). Free Trade Areas and U.S. Trade Policy. Washington, D.C.: Institute for International Economics.

Shoven, John, and John Whalley (1984), "Applied General Equilibrium Models of Taxation and International Trade: An Introduction and Survey," Journal of Economic Literature, Vol. 22, September, pp. 1007-1051.

Spencer, Gregory (1986), Projections of the Hispanic Population, 1983 to 2080, Current Population Reports, Series P-25, No. 995. Washington, D.C., Department of Commerce, Bureau of the Census.

Srinivasan, T.N. and John Whalley, eds. (1986). General Equilibrium Trade Policy Modeling. Cambridge, Mass.: MIT Press.

Tarr, David G. (1989). "A General Equilibrium Analysis of the Welfare and Employment Effects of US Quotas in Textiles, Autos and Steel." Bureau of Economics Staff Report to the Federal Trade Commission. Washington, D.C.: Federal Trade Commission, (February).

U.S. Bureau of the Census (1988) Projections of the Population of the U.S., 1987 to 2080, Current Population Reports, Series P-25, No. 1018. Washington, D.C., Department of Commerce, Bureau of Census.

U.S. International Trade Commission (USITC) (1989). "The Economic Effects of Significant U.S. Import Restraints," Phase I: Manufacturing and Phase II: Agricultural and Natural Resources. USITC Publications No. 2222 and 2314 (October). Washington, D.C.: United States International Trade Commission.

U.S. International Trade Commission (USITC) (1990). "Estimated Tariff Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions in U.S. and Foreign Markets for Sugar, Meat, Peanuts, Cotton, and Dairy Products." USITC Publication 2276. Washington, D.C.: United States International Trade Commission.

U.S. International Trade Commission (USITC) (1991). "The Likely Impact on the United States of a Free Trade Agreement with Mexico." USITC Publication 2353. Washington, D.C.: United States International Trade Commission.

Unger, Kurt (1990). Las Exportaciones Mexicanas ante la Restructuracion Industrial Internacional. Mexico City: Fondo de Cultura Economica/El Colegio de Mexico.

Venables, T. and A. Smith (1986). "Trade and Industrial Policy Under Imperfect Competition." Economic Policy, Vol. 3, pp. 622-671.

Weintraub, Sidney (1990). A Marriage of Convenience: Relations Between Mexico and the United States. New York: Oxford University Press.

Westphal, Larry (1982). "Fostering Technological Mastery by Means of Selective Industry Promotion." In M. Syrquin and S. Teitel, eds., Trade, Stability, Technology and Equity in Latin America. New York: Academic Press.

Whalley, John (1985). Trade Liberalization Among Major World Trading Areas. Cambridge, Mass.: MIT Press.

Wharton Econometrics Forecasting Associates (1984). Trade, Debt and Growth in Latin America. New York: Pergamon Press.

Wijnbergen, Sweder van (1989). "Growth, External Debt, and the Real Exchange Rate in Mexico." Working Paper No. WPS 257, Latin America and the Caribbean, Country Department II, The World Bank.

World Bank (various years). World Debt Tables. Washington, D.C.: World Bank.

World Bank (various years). World Development Report. Washington, D.C.: World Bank.