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The Impact of a North American Free Trade Agreement on California: A Summary of Key Research Findings*

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Introduction

Since the announced start of negotiations for a North American Free Trade Agreement (NAFTA), much has been written about the potential impacts on the U.S. and Mexican economies. Most of the research has been conducted at the aggregate, national level, attempting to measure the overall impact on employment and wages,[1] as well as on the environment.[2] While it is often mentioned that the impact on the U.S. will be more regionally concentrated in the Southwestern border states, surprisingly little research has focused on the largest of the border states, California.[3] This report is the product of a multi-faceted research project at the University of California designed to identify the potential impacts of a NAFTA on California and its constituent populations. In particular, the report focuses on Latinos of immigrant descent who exist as a bridge between the two countries and who are often mentioned as both potentially at risk or potential beneficiaries. While many short term issues are discussed, the aim of the report is to place the discussion of NAFTA in context of the more general and long term issue of the restructuring of the California and U.S. economies and their position in an evolving North American and world economy.

The debate in California has in many ways echoed the national debate which has become polarized along three basic positions. For some, Mexico and NAFTA have become a metaphor and sometime scapegoat for the tremendous loss of U.S. manufacturing employment over the past 10-15 years.[4] For others, NAFTA is seen as a unique and fundamental opportunity for U.S. trade, investment, and employment expansion.[5] Both of these positions, as we will show, are exaggerated. Still others argue that it can be either a positive or negative development, depending on the overall policy context within which it is implemented.[6]

One conclusion with which all analysts agree is that there will be costs as well as benefits. Measuring these costs and benefits is a very complex task since the North American economies are linked in a complex web of trade, capital flows, and migration. Failing to consider the interdependence of these linkages leads to errors in policy analysis. Policy makers in North America have often ignored both negative and positive potential consequences of interdependence. Most policy proposals attempt to influence just one facet of interdependence, a fundamentally limited approach that usually produces unintended and occasionally perverse consequences. For example, in immigration policy, instituting employer sanctions under the U.S. immigration reform law did not stop illegal immigration, but rather pushed it further underground, increasing exploitation and downgrading workplace standards.[7] What emerges most clearly from this research it that we need to develop bi- and tri-national policy perspectives that facilitate the formulation and implementation of policy in an institutionalized manner.

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[1] See Hinojosa Ojeda and Robinson (1992) for a review of studies on the labor impact of NAFTA.

[2] See Grossman and Krueger (1991), Perry et al., (1990).

[3] In comparison, much more research has been conducted on Texas. See Sharp (1992), Rich and Hurlbut (1992), Texas A&M (1992), Governor's Office (1991), and Perryman Consultants (1991). For California, see Polanco Hearings (1991) and a 14 page Governor's Office Memo (1991). Some work is underway on regional impacts. See Brown, Deardoff, and Stern (1992).

[4] See Greider (1992); Faux and Rothstein (1991).

[5] U.S. Council of the US-Mexico Business Council (1991) and KPMG Peat Marwick (1991).

[6] Hinojosa and Robinson (1991); Hinojosa and McCleery (1992); and Prestowitz and Cohen (1991).

[7] Fix (1991); Chavez (1992); and Schey (1992).

The fundamental objective of this research project has been to identify the current and potential impact on the California economy and the Latino population under alternative scenarios for North American integration. While NAFTA includes Canada, we have focused on links between the U.S. and Mexico, which are more relevant for California. Using a variety of modeling techniques as well as industry case studies, we seek to answer the following questions:

> What is the nature of the current pattern of North American integration and what has been the recent impact on California?
>
> Looking towards the future, are we moving towards a high wage or a low wage path of integration in North America?
>
> What policies can be adopted to influence the path of integration for the benefit of both societies?

We consider three alternative scenarios for the future pattern of integration in North America:

1. Full Free Trade,
2. Neo-Protectionism, and
3. Trade Liberalization with policies for growth and structural adjustment.

We find that while the "Full Free Trade" scenario (1) produces higher output levels and better employment for some sectors and workers, it also generates high levels of job displacement and migration among the less skilled, with lower wages for migrants and greater wage inequality in both countries. A "Neo-Protectionist" scenario (2), on the other hand, is actually worse in terms of output, employment, and welfare, with no reduction in migration or inequality. Scenario (3), which combines trade liberalization with policies to generate Mexican development and address adjustment issues in both countries, generates economy-wide output, employment, and more equitable wage growth on both sides of the border.

The total net impact on employment and wages is measured for all three scenarios. Starting from this impact analysis of the entire California workforce, we then explore the specific impact on Latino workers in California.

The key challenge lies in the North American region's political ability to mobilize resources and implement policies for managing the pattern of integration. The common regional goal must be to produce high rates of productivity, income, and employment growth on both sides of the border in an environmentally sustainable and politically participatory manner.

I. Interdependence and Asymmetry

How integrated is California with Mexico?

- The U.S. and Mexico already share by far the most extensive and complex network of linkages of any two countries on opposite sides of the North-South divide. Mexico-U.S. interdependence includes the largest trade relation and the largest debtor-creditor relation between any two developed and developing countries; the largest foreign investment flows; the largest in-bond co-production relations (maquiladoras); and the longest contiguous border with the highest levels of border crossings and border commerce, both legal and illegal (Table 1).

- Mexico is the U.S.'s third largest trading partner (after Canada and Japan) and the U.S. is Mexico's largest trading partner. During the Mexican debt crisis of the early 1980s, U.S. exports to Mexico fell by 50%, the largest contributor to the widening U.S. trade deficit at the time (Figures 1a-c). This loss of U.S. exports resulted in the direct and indirect loss of nearly 200,000 U.S. jobs. Since 1986, however, U.S. exports to Mexico have grown by over $20 billion, generating approximately 300,000 export related jobs (see section III for methodology). Mexican exports to the U.S., however, have not grown as fast as U.S. exports to Mexico. Value added embodied in maquiladora exports to the U.S. has also grown very quickly, but not as fast as overall imports from Mexico.

- California and Texas are the two states most closely linked with Mexico. Mexico is California's second largest export market (8% of total exports) and is Texas'largest (32% of total exports), with Mexico's share of Texas's exports having grown considerably in recent years. Imports and exports between California and Mexico have both grown very rapidly in recent years (Figures 2a-c), creating over 40,000 export-related jobs in California. In 1990, direct and indirect jobs based on California exports to Mexico totaled 63,000, a tiny share of the state's total labor force of 14.6 million. Value added from Baja California maquiladoras has also not grown as fast as overall imports from Mexico. Total jobs in Mexico based on trade with California total 363,000 out of a Mexican labor force of 30 million.

- California is comparatively more linked with Mexico in terms of migration, while Texas is linked much more in terms of pass-through trade and co-production. Half of all Mexican migration to the U.S., both legal and undocumented, comes to California. Tijuana-San Diego hosts the largest legal border crossings (cars and people), and also hosts an estimated 25% of the crossings by undocumented immigrants. The Texas border, five times longer than California's, has the largest dollar value of trade crossing and in-bond production.

- Beyond their relation with Mexico, California and Texas are in general more interdependent globally than most states. California, for example, is a major site for the combination of Asian capital with Latino immigrant labor.[8] Despite Mexico being California's second largest trading partner, trade relations with Asia and the European Community still dwarf trade with Mexico, which represents only 8% of California's trade. California's trade deficit with Japan and South East Asia is the largest of any state.

- Mexico has a pre-NAFTA average tariff rate on U.S. imports more than twice as high (10%) as that of the U.S. protection on imports from Mexico (4%). The most protected sector in bi-national trade is corn in Mexico and fruits and vegetables in the U.S. (Table 2). The manufacturing

[8] Milkman (1991).

sector already enjoys relatively free trade since Mexico has unilaterally reduced its protection dramatically in the last few years — almost as rapidly as will be the case under NAFTA. The current low tariffs indicate that the reduction of tariffs alone will not have major consequences for either country, although the impact of freer trade under NAFTA will be felt more in Mexico than in the U.S.

How uneven is the relationship between California and Mexico?

- Mexico is an extremely small economy compared to the U. S. and even to the California economy (Table 3, Figure 3a-c). The entire Mexican economy is roughly the size of the Los Angeles County economy, despite having ten times the population.

- Wide disparities in the economic sizes of countries exist in North America, with Mexican GDP (Gross Domestic Product) at less than four percent of U.S. GDP and less than forty percent of Canadian GDP. U.S.-Mexico trade represents a much larger share of Mexican GDP (16.4%) than of U.S. GDP (0.6%). Mexico is also much more dependent on trade with California than vice versa. Based on size differences alone, one expects that the effects of NAFTA, both positive and negative, will be much greater for Mexico and Canada than for the U.S. and California.

- Mexico is a poor economy relative to the United States, with U.S. GDP per capita is about 10 times that of Mexico. This income gap is virtually the same between Mexico and California, where GDP per capita is slightly higher than that of the U.S. national average. Baja California's per capita GDP is also slightly higher than the Mexican national average, but still far below California's.

- Mexican average wages are about 16% of U.S. levels in the manufacturing sector.[9] Mexican productivity, however, is also on the order of about 20% of that in the U.S., which still has the highest productivity levels in the world. In some sectors in Mexico, productivity is rising more rapidly than wages.[10] In other sectors, Mexican productivity relative to the U.S. is falling.

- NAFTA represents the most ambitious attempt at integrating a highly developed economy with a developing economy. Development disparities between North American countries are much wider than between any other group of countries that have attempted to integrate their economies. Groups such as the European Community (EC) and the European Free Trade Association (EFTA) started with far less differences in per capita (and total) GDP than that between Mexico and the U.S. (Table 4).

- Income distribution disparities within the U.S. and Mexico are also much wider than within member countries of the European Community. An important element in U.S. income inequality is the widening gap between the incomes of White Americans and those of Hispanics and other minority populations, both U.S. born and immigrant.[11] This widening disparity is especially visible in California and Los Angeles.[12]

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[9] U.S. Department of Labor (1991).

[10] Shaiken (1990).

[11] Hinojosa, Carnoy, and Daley (1991).

[12] See Hayes-Bautista, et al. (1992) and Ong (1989).

What is the role of Latinos in California-Mexico relations?

- By far the most important area of integration between California and Mexico is not trade or investment, but rather large scale and continuous immigration. Immigration has a greater potential for affecting income distribution, the wages of the urban semi-skilled, the wages of Latino workers, and even the level of output, than does trade with Mexico.

- Workers who migrate between Mexico and California represent a larger share of California's labor force than they do of Mexico's (Table 5). Half of all Mexican legal and undocumented immigration comes to the California, representing nearly half of the growth of Latinos in the State.[13]

- Latinos have doubled their numbers in California for the second decade in a row, with Latino immigration representing one third of the growth of the state's population in the 1980's (Table 6). This out-migration from Mexico to California in the last decade, on the other hand, only represents 2.3% of Mexico's population. Unlike previous immigrant waves to the U.S., the large Latino immigrant-origin population in the state maintains strong socio-economic and cultural bonds with their country of origin, fostered by continuing migration.

- The economic size of the Latino population in the U.S. is not much less than that of the entire GDP of Mexico. Average income of Latino workers in the U.S. ($16,000) was 67% of the U.S. national mean and total Latino workers (8.94 million) comprised 7.4% of the U.S. labor force in 1988. Given the current Latino labor force and their average income levels, Latino total income equals $143 billion.

- Immigration is very important to both economies. It is an important source of growth to California, particularly given the state's rapidly aging population. As we will show below, immigration is good for California's overall economic growth and the welfare of wealthier residents. Latino immigration represents one third of the growth of the productive work-force in the state during the last decade. There are, however, negative wage consequences for some elements of the labor force depending on rate of growth of immigration. Immigrant remittances are crucial to Mexico, estimated to be on the order of $2 to $3 billion a year. Contrary to U.S. public perception, Mexico actually subsidizes the U.S. and California in net terms on social-services spending by absorbing the health and education costs of pre- and post-working-age migrants.

- Even though Mexico's population growth rate has slowed dramatically in the last twenty years, Mexico's labor supply is still growing at about 3% a year, far more rapidly than in the U.S.; and the rate will decline only slowly for the rest of the decade. This rapid growth will place strains on the Mexican labor market, leading to migration pressures both within Mexico (rural-urban) and internationally. Mexicans in the U.S. are also the fastest growing native-born and immigrant minority, projected to be the "majority minority" in California by the year 2030.[14]

- Latinos comprise 23% of California's employed labor force and 30% of the Los Angeles County employed labor force. L.A. county contains 46% of the state's Latino jobs. At both the state and county level, they are more highly concentrated in the more labor intensive and lower-wage

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[13] Hayes-Bautista, et al. (1992) and Passel and Woodrow (1984).

[14] Hayes-Bautista, et al. (1992), p. 27.

industries and occupations, such as durable and especially non-durable manufacturing, wholesale and retail trade, and construction (Table 7, Figure 4).

- Latino workers are over represented in those sectors of the economy engaging in a high levels of trade with Mexico and are under represented in the "non-traded" sectors of the economy (Figure 5). Latinos are concentrated in labor-intensive industries which face import competition from economies like Mexico's and are less represented in export industries which are likely to gain from increasing exports to Mexico. California industries in which there are considerable imports employ a disproportionate share of immigrants, whereas high export industries employ relatively few immigrants.[15]

- The structure of employment in Mexico also shows high levels of labor force concentration in sectors of the economy where import penetration is a major risk. This is particularly true of agriculture and some heavy manufacturing, both of which were heavily protected. Rural employment is very high as a percentage of the labor force (especially compared to both the U.S. as well as other semi-industrial economies at similar level of economic development) but produces a much lower share of output, providing an indicator of the most extreme poverty in North America (Table 2).

Border Environment and Infrastructure

- Environmental quality in California and Mexico is also highly interdependent, particularly, but not exclusively, along the border. U.S.-Mexico maquiladora co-production activities on the border are currently generating large amounts of toxic wastes which by law should be either treated in Mexico or returned to the U.S. for treatment. Recent research, however, indicates that 85% of the toxic wastes generated along the California-Mexico border are neither being treated in Mexico nor being returned to the U.S. If they were to be returned to California, they would represent a 10% increase in the total of toxic waste shipped within the state for treatment.[16]

- Recent research also indicates that border economic growth has far surpassed the necessary infrastructure spending needed to sustain continued job creation or rising living standards. A recent study by the Colegio de la Frontera Norte estimated that a $15 billion deficit in needed infrastructure investment has developed on the Mexico side in the 1980s.[17] Similarly, the Border Trade Alliance has estimated needed infrastructure spending on the U.S. side at $5.7 billion.

II. U.S.-Mexico Integration and California Employment Restructuring

How important has been Mexico's role in the internationalization and restructuring of the California economy?

- California is being hard hit by the emergence of a new global configuration arising from the end of the cold war in Europe (with the associated decline in U.S. defense spending) and the emergence of Asia as major exporter and foreign investor. These changes are having profound impacts on

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[15] See Abowd and Freeman (1991) for similar findings on the national level.

[16] Perry, et al. (1990).

[17] Zepeda and Sotomayor (1992).

employment in California, as are other domestic social and economic challenges faced within the U.S. In comparison, Mexico has played a relatively small role, either positively or negatively.

- Any assessment of the anticipated impact on California labor by a North American Free Trade Agreement with Mexico requires an overview of the potentially most affected portions of the economy. Southern California, and Los Angeles County in particular, have been a bellwether for the state because over 63% of manufacturing employment is in the seven southern counties (Figure 6). For the purpose of this report, the focus will be on Los Angeles County, although the policy recommendations at the conclusion are applicable statewide.

How significant is manufacturing for employment and labor trends? What changes have been taking place in the region?

- Los Angeles dominant. Los Angeles has been the major manufacturing center in the nation — no county has had more manufacturing jobs than Los Angeles. Los Angeles accounted for 46% of California manufacturing jobs in 1979.

- Manufacturing peaked. Manufacturing employment reached its peak in 1979 for both Los Angeles County and the United States, while California peaked in 1989.

- Manufacturing job losses. Since 1979, manufacturing in Los Angeles alone had a net loss of 128,200 jobs, accounting for 5% of the nation's total manufacturing loss of 2,614,000. Although Los Angeles declined at a slower rate than the nation through 1990, the severe aerospace losses resulted in Los Angeles exceeding the U.S. in net employment loss between 1979 and 1991: -13.9% to -12.4% (Figure 7).

- Two periods of job losses. Manufacturing losses were experienced in two distinct waves: first, in the recession of the early 1980s, Los Angeles lost 71,800 jobs and then, second, following a partial recovery, losses began in the late 1980s through 1991 for an even greater loss of 109,200 jobs. An additional 35,700 manufacturing jobs have been lost in Los Angeles through July of 1992 (Figure 8).

- Heavy manufacturing restructured in the early '80's. Traditional basic industry — primarily durable non-aerospace that provided higher-wage, stable employment for blue collar workers — was "restructured," with severe layoffs and plant closings in steel, autos, and tires accounting for approximately 25,000 direct jobs lost in large plants due to shutdowns. Twice as many additional jobs were lost due to layoffs and the closing down of small firms — job losses that were not noted in the press (Figure 9).

- Causes for plant closings. The severe wave of layoffs and plant closings in steel, autos, and tires could be attributed to international competition, inadequate investment (and disinvestment) which resulted in the failure to upgrade existing plants, consolidation of branch plants to other parts of the U.S., and the pursuit of lower wages and higher profits through offshore production.

To what extent were the job losses in the first cycle of industrial restructuring in the early '80's "exported" to Mexico?

- Maquila employment linked to U.S. business conditions. In general, overall maquila employment growth has been influenced by the business cycles in the U.S.: Recessions in the U.S. are reflected in lower maquila employment levels (Figure 10).

- Mexico job growth does not match U.S. job losses. Although there are explicit cases of firms, such as Bournes Electric in the earlier period and Finegood Furniture in the more recent period, that set up maquila plants on the border, simple aggregates of numbers suggest that the maquila employment growth along the border could not possibly account for the job losses experienced by Los Angeles, much less California or the nation (Figure 11).

- No flow of jobs to maquilas during the recession. Maquilas were not direct employment beneficiaries during the peak period of plant closings and job losses in L.A./California: maquilas also lost employment in 1982.

What was the impact of Mexico on California/Los Angeles employment in the more recent period, following the recession of the early 1980's?

- Manufacturing growth came from aerospace/high technology. Most manufacturing employment growth in Los Angeles following the recession of the early 1980s came from high-wage, defense-dependent, aerospace/high technology industries that were relatively unaffected by the recession of the early 1980's (Figures 12 and 13).

- Recent losses in manufacturing are primarily due to the severe U.S. recession and the aerospace losses resulting from defense downsizing. Los Angeles was early to feel the decline in Pentagon purchasing. At the same time aerospace industry restructuring involved the redeployment of production from California to other states, such as Arizona and Georgia. In most recent period, the aerospace decline was exacerbated by the lengthy and severe national recession which still continues.

- Significance of Mexican immigrant labor force. The availability of an expanding low-skilled labor force due to both documented and undocumented immigration (which is overwhelmingly Latino, particularly Mexican) encouraged the growth of industries that could benefit from a growing supply of low-wage workers: food processing, apparel, hotels, and restaurants. Figure 14 illustrates the concentration of Mexican-origin population and the coincidence of manufacturing sites.

- Non-durable manufacturing only sector with net growth. Remarkably, in contrast to a nationwide decline, the low-wage, non-durable, manufacturing sector in Los Angeles, dominated by apparel, had a higher employment level in 1991 than in 1979 — despite the recession (Figure 12). The nondurable sector is overwhelmingly dependent upon Latino, particularly Mexican, immigrant workers. It grew during the period 1987-90 while durables lost (Figure 15), and it has not suffered the severe losses that durables have during this recession (Figure 16).

- Growth of low-wage industries. Overall, the net effect of the combined losses of basic manufacturing and aerospace, along with the growth of non-durables and low-end services, has resulted in the expansion in low-wage jobs at the expense of middle- and higher-wage jobs. Three-fifths of the

additional private sector jobs in 1990 were in industries with average wages under $15,000 per year.

- Maquila employment shifts tend to parallel local changes. Despite the fact that maquila manufacturing firms have been increasing in Mexico, and that many of them do have links to U.S. firms, the maquila employment changes generally mirror Los Angeles and California changes. For example, as California recovered in 1984 with additional jobs, so did maquilas. The job losses in Los Angeles/California manufacturing in the most recent recession (Figure 16) are paralleled by a declining growth rate by maquilas.

- Declining number of California firms going to Mexico. According to the most recent Southern California Edison industry migration study of 668 manufacturing firms that left the region over the past five and one-half years: about 140 of these firms (21%) went to Mexico, accounting for about 15,500 jobs (17% of the total 92,000 jobs). The remainder were identified as relocating in other states, with Nevada, Arizona, and Texas gaining the most. Of particular note is that the number of firms and number of jobs going to Mexico declined since 1989.

- Maquila worker productivity lower than in U.S. Data in a study by the United States International Trade Commission on a sectoral basis shows that, on average, maquila productivity is approximately one-third of U.S. manufacturing productivity. To represent the number of potential productivity-equivalent U.S. jobs in the maquilas, the maquila employment number should be adjusted downward.

- Mexican imports to California have not reduced California's exports to Mexico. During the period 1986-1990, Mexican imports to California increased, but at the same time, so did California exports to Mexico. California-Mexico trade appears to be complementary rather than competitive.

What has been the impact of Mexican industrial growth, and maquilas in particular, on labor in Los Angeles?

- There is no conclusive evidence that demonstrates a dramatic and direct link between job losses in Los Angeles manufacturing and the increase in maquila manufacturing firms. However, for a number of reasons, there is a continuing concern about the potential adverse impact of free trade with Mexico.

- Chilling Effect of maquilas. Interviews with union officials and workers indicate that it takes only a few twin plants or runaway shops to create a "demonstration effect" which results in a chilling effect on organizing efforts and on contract negotiations. The consequence is that the proximity of Mexico and the apparent ability of U.S. firms to move makes workers feel more vulnerable, particularly because of the apparent lack of alternatives to respond to business flight.

- Workers more vulnerable due to weak unionization. The declining level of unionization in the U.S., California, and Los Angeles makes workers far more exposed to potential, implied, or explicit threats by management to move production activities across the border (Figures 17 and 18).

- Adverse consequences for workers when the implicit labor market is expanded to include Mexico and the border area. Even though a U.S. firm may not move its production to Mexico, the perception of an implicit expanded regional labor market — due to the potential for capital

mobility — serves to provide a downward pressure on wage demands by workers and unions (Figure 19).

- Unions did not organize Latino industries. For a long period, organized labor neglected organizing efforts within the growing Latino immigrant labor force, particularly in the lower-wage manufacturing sectors that are more susceptible to offshore production. The situation, however, appears to be changing, but mostly in service sector unions that are making special efforts, for example, to organize in hotels, restaurants, and building maintenance, for example.

- Insufficient cross-border contact and joint organizing. Little effort and resources have been devoted by unions to establish close and continuing cross-border relationships between workers and their respective unions in the same industries (and even with the same owner). Unions in the U.S. know little about U.S. subsidiaries or Mexican-owned industries, and there is little basis for cross-national organizing campaigns.

- Mexico has become an immediate and close-by symbol of the concern with capital flight. The export of jobs offshore, particularly to Europe and Asia, has become a part of U.S. multinational strategy. Despite the relatively small portion of job losses to Mexico, its attraction not only to large corporations, but also to smaller, locally-based firms exemplifies the larger concern with capital flight and local economic dislocation.

III. Macro-Models of Impacts of Alternative Scenarios of Integration

What type of modeling is most appropriate for analyzing the employment and income effects of California-Mexico integration?

There are four types of models which have been used to assess the impact of the creation of a NAFTA on employment and wages. In this research project we have used all four of these approaches, in addition to a series of industrial case studies, to analyze the future potential course of California-Mexico integration and the restructuring challenges the state will face.

(1) Computable general equilibrium (CGE) models allow for the analysis of direct and indirect impacts of tariff reduction on the changing composition of trade, output, employment, and wages across a variety of sectors and labor market groups within and between countries and regions.[18] CGE models simulate the entire workings of an economy including production, distribution, consumption, savings, investment, trade, and (in some models) migration within a single model. Both static and dynamic CGE models have been constructed to analyze NAFTA. A comparative statics approach lets one look at the long-term impact of changing policy variables, such as shifting trade policy or increasing investment. To analyze the changing composition of employment — which sectors gain and lose in the long run — these models typically specify the level of aggregate employment exogenously and focus on shifts in the sectoral composition of employment. Dynamic CGE models seek to trace out the adjustment path an economy follows over time as it moves to the new, post-trade-reform equilibrium. These models, however, do not

[18] Single-country and multi-country CGE models have been widely used for policy analysis in developing and developing countries to analyze issues of trade reform and structural adjustment. See Robinson (1989), de Melo (1988), and Shoven and Whalley (1984) for surveys of this earlier work. Brown (1992), Hinojosa and Robinson (1992), and USITC (1992) survey CGE models used to analyze the impact of NAFTA.

seek to trace out the short-term macro effects of policy changes on cyclical unemployment. Instead, the focus is on the long run and on problems of structural adjustment in moving to a new equilibrium.

We have developed a multi-country CGE model of the U.S., California, Mexico, and the rest of the world. Our Cal-NAFTA model includes 11 sectors and 4 labor markets segmented by skill categories. The model is described in the Appendix.

(2) Macro multiplier models of growth and trade have been widely used to analyze changes in the volume of trade between countries and regions. Models of this type simulate the impact of economic growth on the size and balance of trade, determining the absolute level of employment generation as a fixed multiple of the trade volume. Most models of this type do not, therefore, analyze the changing composition of trade due to a change in trade policy.[19] The major problem in applying this approach is the confusing of the impact of trade liberalization with that of macro-economic growth. In addition, these applied models have tended to overestimate both job gains from NAFTA by keeping technology constant (assuming fixed coefficients) as well as overestimate job losses by assuming that every import represents a job loss in the U.S. in a fixed multiplier fashion. Most importantly, they also ignore the impacts of investment flows on the creation and displacement of jobs.

We developed a 34 sector, trade/growth multiplier model to analyze the labor displacement impact of trade liberalization. In the model, the composition of trade is determined by the Cal-NAFTA CGE model and the labor displacement impact of imports is modelled without assuming fixed coefficients, but instead assuming different sectoral elasticities of substitution between domestic and imported goods.

(3) Investment-flow models seek to determine the aggregate employment impacts of U.S. direct foreign investment (DFI) abroad.[20] The principle problem in the application of these models has been their tendency to overestimate job loss by assuming that any additional investment abroad results in a drop in aggregate U.S. investment. These approaches also tend to underestimate the job multiplier effects of DFI. Nevertheless, they can be very useful in adding to our understanding of the job displacement effects, as well as the job creating effects, of shifting investment.

We use a variety of estimates of the impact of NAFTA on the level of investment and the resulting impact on employment. We also used the Cal-NAFTA CGE model to explore some of the same issues.

(4) Immigration Models have been used in a handful of studies which have attempted to integrate an analysis of trade and investment with immigration as a result of NAFTA.[21] Here one must be careful not to confuse the employment and wage effects of trade liberalization with those of immigration. At the same time, one should consider the second-round effects that trade liberalization might have on employment and income through increases or decreases in both rural-urban and international migration.

The Cal-NAFTA model captures a variety of migration patterns: Mexican rural to U.S. rural; Mexican rural to Mexican Urban; Mexican urban to U.S. urban; and links between California and U.S. labor markets.

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[19] Hufbauer and Schott (1992); Prestowitz and Cohen (1991); and Sharp (1992).

[20] Faux and Spriggs (1991); Koechlin, et al. (1992); and Hinojosa and McCleery (1992).

[21] Levy and van Wijnbergen (1991); Hinojosa and McCleery (1992); and Robinson et al. (1991).

Below we review the results of each of these four modeling approaches, each of which is better suited to answering a different type of question. We attempt to determine what are the relative impacts on California employment and wages of:

(1) trade liberalization or protectionism;
(2) Mexican investment and economic growth;
(3) direct foreign investment growth in Mexico; and
(4) Mexican migration flows to the U.S.

We use these modeling techniques to analyze the impact of three types of alternative scenarios:

I. Full Free Trade
II. Neo-Protectionism
III. Trade Liberalization with policies for Growth and Structural Adjustment.

We find that while the "Full Free Trade" scenario (type I) produces higher output levels and better employment for some sectors and workers, it also generates high levels of displacement and migration among the less skilled with lower wages for migrants and greater wage inequality in both countries. A "Neo-Protectionist" scenario (type II), on the other hand, is actually worse in terms of output, employment, and welfare, with no reduction in migration or inequality. Only scenario type III, which combines trade liberalization with policies to generate Mexican development and address adjustment issues in both countries, can generate economy-wide output, employment, and more equitable wage growth on both sides of the border.

Within each scenario type, we conducted various model simulations, or experiments, which are designed to sort out the contribution of different policies to the results. For scenario type I, we did four experiments:

(1) Remove only non-agricultural tariffs and non-tariff barriers;
(2) Remove all tariffs and non-tariff barriers in all sectors, including agriculture;
(2a) The same as (2), except that some U.S. protection against Mexican fruits and vegetables remains (at half the initial protection level); and
(3) Full trade liberalization plus the removal of all agricultural subsidies in Mexico.

For scenario type II, we did a single experiment:

(4) Increase trade protection on both sides of the border by 20% (1.2 times current protection levels), plus removal of all Mexican agricultural subsidies.

For scenario type III, we did four experiments:

(5) Increase productivity in Mexico, starting from experiment (3) and partially removing distortions in the Mexican capital allocation in intermediates, consumer durables, and light manufacturing;
(6) Increase growth in Mexican capital stock, starting from experiment (3), increase the aggregate Mexican capital stock by 20 percent, relative to the U.S.;
(7) Increase Mexican balance-of-trade deficit (by a net swing of $20 billion from the base), starting from experiment (3); and
(8) Increase growth of the Mexican capital stock plus increased Mexican balance-of-trade deficit, combining experiments (6) and (7).

The total net effects of integration on employment and wages are measured with all of these approaches for all three scenario types. Starting from the impact analysis for the entire California workforce, we then consider the specific impacts on Latino workers in California.

(1) **What will be the impact of reducing tariffs between the U.S. and Mexico?**

- Trade liberalization under NAFTA will, by itself, have a relatively small impact on output, employment, and wage levels, particularly in the U.S. NAFTA alone will also have little impact one way or another on the wide gaps in incomes between the two countries. This conclusion follows from the relatively small rates of tariff protection which remain to be reduced (4% by the U.S. on imports from Mexico and 10% by Mexico on imports from U.S.). What turns out to be much more important is the rate of growth of Mexico and nature of international factor flows, such as capital investment and labor migration.

Tables 8 through 11 display the impact on California, Mexico, and the U.S. of alternative scenarios of tariff reduction or increase. Table 8 shows the aggregate output and trade results, Table 9 shows the sectoral output and trade results, and Tables 10 and 11 show the employment displacement and wage results by sector and by labor market segment.

The first set of scenarios (1-3) show the impacts of various stages of trade liberalization between the Mexico and the U.S. The second set (scenario 4) shows the impact of increasing tariffs at the rate at which they increased between Mexico and the U.S. from the mid 1970s to the mid 1980s. The third set of scenarios (5-8) show the impact of trade liberalization in conjunction with policies that result in Mexican economic growth and, during a transition period, an increased Mexican trade deficit.

The static effect of lowering tariffs, by itself, is minuscule with respect to the size of the labor force, in both the U.S. and California. Lowering tariffs also has virtually no impact on wage rates of any labor market segment, from the highest to the lowest paid. California wage rates of the rural and urban unskilled workers are much more directly effected by possible migration dynamics, discussed below, than by trade liberalization.

(2) **What is the impact of Mexican economic growth?**

- The most important binational determinate for raising the level of employment and income in the U.S. and Mexico is the ability to maintain a high rate of growth of the Mexican economy and thus of U.S. exports to Mexico, which in turn necessitates a high level of investment in Mexico (both domestic and foreign). Mexican investment and growth is in part dependent on Mexico's ability to export to the U.S., and is essential for the maintenance of high levels of U.S. exports to Mexico and thus job creation in the U.S. and California. A financial imbalance such as the 1982 debt crisis would have a devastating impact on the Mexican economy and detrimental spillover effects on the U.S. and California labor markets.

Tables 12 and 13 present the historical and potential future relationship between the growth of U.S.-Mexico trade and employment in California.

Trade exports as a source of job gain is determined through the total direct and indirect jobs associated with a billion dollars of California exports by sector.[22] The loss of jobs associated with imports is determined by whether imports in a sector are competitive or complementary to U.S. production, determined by the trade elasticity of substitution.[23]

This approach is necessary because it is incorrect to assume, as does the IIE model, that all imports from Mexico displace U.S. jobs.[24] Similarly, the Sharp (1992) model, which is also based on the CIEMEX-WEFA (1991) model, only looked at net export change. Even with the use of import coefficients, this approach will likely overstate job losses since it ignores the distinction between imports from Mexico that reflect a diversion of trade from other countries versus imports that displace U.S. production. In the case of trade diversion, the employment effects in the U.S. would be zero.

Table 12 shows the impact of the 1981-1985 trade collapse and of the 1986-90 trade expansion between Mexico and California. During the Mexican debt crisis, California trade with Mexico went from a trade surplus of $1.25 billion in 1981 to a trade deficit of $1.5 billion in 1983 resulting in a net loss of over 17,000 jobs. During the recent recovery of the Mexican economy, there has been a dramatic growth of California exports to Mexico, which has generated 44,000 jobs in an otherwise bleak economic period. Imports from Mexico, which have grown only slightly more slowly than imports, can be shown to have displaced 40,000 jobs during the same period, for a net job gain of close to 4,000. Job gains during the latter period were in relatively higher-wage industries (such as aerospace, other transportation equipment, metal industries, and plastics), with major losses in lower-wage industries (such as furniture, apparel, and leather products). Electrical and electronic equipment showed the largest gains in two-way trade and employment shifts, resulting in a net loss of jobs.

Table 13 shows the results for the period 1990-1995 of alternative scenarios of Mexico-California trade. Following the IIE model, we simulate the impact of a scenario where NAFTA leads to rapid Mexican growth, with a net capital inflow and a U.S. net trade surplus.[25] In augmenting the simple IIE model, we incorporated sectoral differentiation between competitive and complementary imports and use the new composition of trade resulting from the lowering of tariffs in NAFTA, as generated in the Cal-NAFTA CGE model.

Three fundamental results of this exercise are that:

- Any scenario where Mexico grows and generates a trade surplus for the U.S. necessarily produces a net positive gain in U.S. jobs. The result of a net gain for the U.S. should in fact be quite intuitive at the aggregate level and is confirmed by the sectoral breakdown, which takes into account the fact that U.S. export sectors are more capital intensive and thus generate less jobs than the more labor intensive sectors which are susceptible to import competition from low-wage countries. A net gain in U.S. exports should also be expected given that NAFTA will force Mexico to reduce its relatively higher tariffs, compared to the U.S. reduction of its relatively lower tariffs.

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[22] U.S. Department of Commerce (1991).

[23] See de Melo and Robinson (1989) and Robinson (1989) who discuss the use of trade substitution elasticities in trade theory. Reinert and Shiells (1991) provide estimates of substitution elasticities in the U.S.-Mexico case.

[24] Hufbauer and Schott (1992).

[25] The IIE model uses projection from 1990 to 1995 taken from the CIEMEX-WEFA macro model. See Hufbauer and Schott (1992), Table 1.5.

- The types of jobs gained in the U.S. through increased exports are concentrated in higher-paying industries and occupations compared to the jobs lost to increased imports, which are in the lower-paying jobs and occupations. As we will see below, Latino immigrants are especially vulnerable.

- The only way that NAFTA can be shown to be a net job loser for the U.S. is if the Mexican economy undergoes a major macro-economic adjustment, such as a another debt crisis, forcing it to generate a trade surplus that increases the U.S. trade deficit. The results of such a scenario are shown in Table 13.

It should be noted that the optimistic scenarios, as well as the recent past, whereby Mexican trade liberalization is associated with large capital inflows and increased trade deficits. While good for U.S. exports and jobs in the short run, these deficits must be financed through increased borrowing or increased foreign investment. In common with other semi-industrial countries that have shifted to an open development strategy, Mexico will have a transition period during which there will be increased trade deficits, followed by a repayment period in which Mexico will have to achieve trade surpluses. If this transition period is not managed properly, there is a danger of financial instability and foreign exchange crises of the sort that Mexico underwent in the 1980s.

(3) What is the impact on the U.S. of increased investment in Mexico?

We have seen how high rates of Mexican net import growth can generate high rates of U.S. net exports and U.S. net job creation. This trade growth, however, must in turn be financed by high rates of investment in Mexico, including foreign direct investment.

Many have voiced concern that direct foreign investment (DFI) abroad to take advantage of low wages in Mexico is a source of job loss in the U.S. Studies have tried to link DFI to the loss of jobs through (1) directly shifting of some plants to Mexico and/or (2) through a drop in aggregate U.S. investment as investment rises in Mexico.[26] The first of these mechanisms is evident, and one sees employment displacement due to plant closings. There is, however, no evidence for the second mechanism, whereby DFI in Mexico reduces aggregate U.S. investment. In fact, using the methodology of Koechlin et al. (1992), which is based on the historical experience of EC enlargement, NAFTA should produce an increase in investment inflows to the U.S. since this is exactly what happened in Northern and Southern Europe after EC enlargement.[27]

We followed this general approach in an exercise designed to determine the historical rate at which U.S. DFI can be shown to cause U.S. job displacement. This increasing rate is then used to project future job displacement as a function of alternative scenarios of future U.S. DFI in Mexico, with and without a NAFTA, and under a scenario of a new Mexican adjustment crisis.

Estimating job displacement as a function of investment flows is an alternative to using a direct approach which relates job displacement as a function of changes in the volume and composition of imports. The implicit assumption in focusing on investment flows is that such flows reflect changes in the location of production from the U.S. to Mexico for the purpose of increasing exports to the U.S. The links are tenuous in that factors other than capital flows from the U.S. to Mexico will affect the volume and structure of trade between the two countries, and hence employment. The results of this investment-

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[26] Koechlin, et. al. (1991) and Faux and Spriggs (1991).

[27] IMF, International Financial Statistics (1992).

focused analysis would be subsumed under the previous two approaches, both of which directly estimate changes in the volume and structure of trade.

Formula for determining relationship between U.S. DFI in Mexico and U.S. Employment:

While the movement of particular plants to Mexico is easy to identify, the causes of capital movement are very complex. Direct foreign investment is by no means merely a function of low wages, but is also the result of many other factors including:

- relative rates of productivity growth,
- relative rates of profit,
- relative political risk in the foreign country,
- relative skill levels of the workforce,
- existing capital stock in the home country,
- networks of producers and distributors, and
- availability of infrastructure including utilities, transportation, financial, and communications facilities.

Not all capital flows to Mexico represent direct investment in employment-creating activities. A great deal of recent capital inflows have been of a speculative nature, landing in the stock market as it seeks higher financial returns anywhere in the world. Direct foreign investment in Mexico was responsible for only 52% of the capital account in 1990.[28]

In addition, U.S. investments in Mexico do not necessarily produce plant closures in the U.S. Most U.S. multinational investment in Mexico has been, in fact, designed to capture a share of the growing Mexican market. Historically, the Mexican government has maintained high tariffs in order to force U.S. multinational corporations (MNCs) to invest there if they want to sell to Mexico, even though it may be cheaper to produce in the U.S. and export to Mexico. This practice, the historical basis of import-substituting industrialization, will be largely prohibited under a NAFTA. The lowering of Mexican tariffs under NAFTA will thus presumably further encourage the recent surge of U.S. exports, with a net gain for U.S. employment. In a post-NAFTA setting, MNC investments in Mexico for the servicing of the Mexican market will be a function of relative productivity and costs rather than tariffs.

U.S. DFI <u>can</u> be said to be displacing U.S. employment if that DFI is, in effect, a movement of operations to Mexico for re-export back to the U.S. Under this criteria, we can consider (1) U.S. maquiladora investment and (2) that share of U.S. multinational investments which are oriented towards the U.S. rather than the Mexican market. Maquiladora investment and employment compared to total U.S. DFI operations has been rising over the last 20 years. The ratio of exports to national sales of multinational enterprises in Mexico is still surprisingly small even though that percentage has more than tripled in the last 20 years and even though MNCs are responsible for 53% of Mexico's non-petroleum exports.[29] In 1990, only 38% of total sales of the largest MNC exporting firms were geared away from Mexico's internal market (Table 14). It is important to factor into future scenarios that both labor-displacing mechanisms of U.S. DFI in Mexico have been rising over the last two decades.

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[28] Banco de Mexico (1991).

[29] Unger (1990).

There are also important feedbacks to U.S. exports of investing in Mexico which must also be taken into account in determining the net displacement of U.S. labor. Investment abroad has positive employment impacts through (a) directly supporting U.S. productive activities (as of source of demand for inputs and as sources of assembled components in the case of integrated MNC production or Maquiladoras), (b) generating U.S. capital goods exports for new investments, and/or (c) indirectly sustaining growth in Mexico and financing Mexico's trade deficits, thus sustaining U.S. exports.[30]

These multiple formulas for attributing job displacement and net job losses to U.S. DFI in Mexico have to been seen as producing an upper-bound estimate for (at least) the following reasons. First, to assert that U.S. firms relocating production to Mexico result in U.S. job loss does not mean that all these same firms and jobs would or could have stayed to operate profitably in the U.S. Most plant relocations to Mexico occur in sectors facing strong import competition from Asia.[31] Second, some U.S. DFI into Mexico for export to the U.S. reflects closure of U.S. operations around the world and their relocation to North America. Such was the case in the recent Zenith announcement that as it was moving its last U.S. assembly plant to Mexico, it would also move 600 jobs from its Taiwan facility to Mexico to reduce costs in producing for the North American market.[32] Third, DFI in Mexico has a higher rate of indirect job creation than other DFI due a tendency of operations in Mexico to source largely from the U.S., given the proximity of the two countries.[33]

How many U.S. jobs have been lost due to direct foreign investment in Mexico in recent years?

Total direct foreign investment in Mexico in 1990 stood at slightly over $30 billion, up from $14.6 billion in 1985 and $8.5 billion in 1980 (see Table 15). Of the $21.8 billion growth of new DFI in Mexico during the 1980s, $4.7 billion was reinvested profits, with the rest constituting new investments. The U.S. is the source of about two thirds of Mexican DFI ($19 billion in 1990, up from $9.8 in 1985 and $6.8 billion in 1980), which nevertheless constitutes only about 3% of total U.S. DFI worldwide in 1990.[34] The growth of new U.S. DFI into Mexico during the late 1980s of approximately $6.8 billion represents only 0.14% of the $4.6 trillion dollars of U.S. gross private domestic investment during the same time period.[35]

U.S. DFI in Mexico, while representing a minute share of U.S. aggregate investment, nevertheless can be seen as having directly displaced up to 13,700 jobs from 1985-90 (Table 15). Given that California represents 14.5% of U.S. trade with Mexico, the California share of this job displacement can be estimated at close to 2,000.

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[30] We will follow Koechlin et al. (1991) in adopting a ratio of $120,000 per unit of employment in assessing the displacement effects of DFI, which incorporates the calculation by Frank and Freeman (1978) of direct and indirect employment generation of DFI.

[31] In a survey of 323 U.S. companies that import under 806.30 and 807.00 (Maquiladoras), 67 percent reported that they would have lost market share to foreign producers if they did not source from Maquiladoras, 38 percent would have moved more of their operations abroad, 41 percent would have stopped producing certain product lines, 13 percent would have moved all their operations abroad, and 16 percent would have gone out of business. USITC 1988:7-26.

[32] Wall Street Journal, Nov. 22, 1991.

[33] Schoepfle and Perez-Lopez (1988).

[34] See Survey of Current Business (1991) for information on U.S. direct foreign investment.

[35] Economic Report of the President (1992), Table B-26.

How many U.S. jobs could be displaced by DFI in the future?

Table 15 also summaries the results of alternative scenarios of investment and trade flows on U.S. employment. Three future scenarios are explored: (1) a base-run scenario of trade and capital flows in the absence of NAFTA; (2) an autarkic adjustment scenario characterized by a renewed adjustment crisis and collapse in trade; and (3) a "NAFTA-Plus" scenario, which simulates trade liberalization being accompanied by large capital inflows to Mexico. Alternative scenarios (1) and (3) presented here are based on the macro-economic projections of IIE and CIEMEX/WEFA, in addition to our simulation of a debt crisis scenario.

The results indicate two otherwise seemingly paradoxical conclusions.[36] First, the more Mexico grows and the U.S. gains from exports, as in the "NAFTA-Plus" scenario, the more the U.S. loses other jobs through increased imports and through investment flowing to Mexico. In net terms, however, the U.S. still stands to gain as its export markets expand and create employment at a faster rate than displacement due to imports or jobs lost through transplanted operations in Mexico for export back to the U.S. Second, the U.S. loses employment in net terms only in the case of reduced U.S.-Mexico trade, either through a collapse of Mexico as a market for U.S. exports (such as a in a debt crisis), through an end to U.S. investments in Mexico, or through a closing off of Mexican exports to the U.S. market. It is in everyone's interest to avoid such "collapse" scenarios.

(4) <u>What are the likely impacts on Mexican migration to the U.S. under alternative scenarios of economic integration between Mexico and the U.S.?</u>

- The reduction of industrial (non-agricultural) tariffs and non-tariff barriers will, by itself, have a small increasing impact on the flow of migration (Scenario 1 in Table 16). This result is due to primarily to the fact that non-agricultural trade liberalization has a very small impact on labor displacement compared to the size of the work force in either country.

- The reduction of all tariff and non-tariff barriers, including all agricultural protection (experiment 2), will have a much larger and increasing impact on out-migration from Mexico. There is a domino effect. Large out-migration from the Mexican countryside to the cities due the inability of Mexico to compete in corn and other grains in the face of much more efficient U.S. producers leads, in turn, to increased migration from Mexican urban areas to the U.S. While fruit and vegetable exports from Mexico rise, employing more rural labor, this effect is not enough to absorb labor released from corn production.

- The recently negotiated NAFTA, the text of which was released in September of 1992, will likely produce even higher out-migration due to long phase-ins in fruit and vegetable imports into the U.S., and thus a slower growth of agricultural employment in Mexico (experiment 2a).[37] While Mexican corn tariff reductions have also been granted long phase-ins, Mexican government officials note that corn tariffs will be reduced more rapidly than allowed due to ongoing reforms of the Mexican agricultural sector. These reforms include: (1) privatization of Agate land, (2)

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[36] We have used the IIE/CIEMEX-WEFA and World Bank macroeconomic projections to yield essentially the same proportional results, although the absolute level of output and thus employment vary from macro model to macro model. Our CGE model has capital flowing into Mexico, but not having an impact on aggregate U.S. investment. Investment flow to Mexico from the U.S. is determined by: equalizing rates of profit differentials to pre-NAFTA levels; rising capital flows due to increased political confidence; and raising Mexican productivity (reducing market distortions).

[37] US Trade Representative (1992).

reductions in subsidies, as well as (3) tariff reductions.[38] If Mexico completes its proposed reform of the agricultural sectors within the next decade as planned, this will result in an even larger outflow of labor from the countryside.

- Large migrations based on the restructuring of the Mexican agricultural sector will have a much more important impact on relative wages in both countries than either trade or investment liberalization.

What could offset the increasing pressures for out migration?

- If tariff liberalization results in large increase in productivity in both countries, migration could be reduced substantially, perhaps by one third (experiment 5).

- If the Mexican capital stock is increased relative to that of the U.S. by 20% (Scenario 6), this could eliminate the entire increase in migration pressures arising from agricultural liberalization in Mexico (Figure 20). Experiments 7 and 8 show an even greater impact from a combination of Mexican capital stock growth with an increased Mexican balance-of-trade deficit.

- The availability of long term credit and technical assistance to small- and medium-scale producers in rural Mexico would direct capital stock growth toward more labor-intensive producers.

What is the net impact of migration flows in a post-NAFTA North America?

- Labor migration into California is good for the economy of the state. Every immigrant who works produces and consumes goods and services, pays a variety of taxes, and contributes to the wealth of the state. In addition, immigration makes many California labor-intensive exports more competitive.

- The largest negative impact of increased immigration is felt by other immigrant workers who, together, compete in very specific and generally quite segmented labor markets. While increased immigration may result in falling real wages for other immigrants, it also results in increased real wages for all others who consume the now less-expensive products of immigrant labor. The net effect is increased wage inequality.

- California faces a trade-off between continued growth of low-wage employment in the state based on immigrant labor or the loss of some low-wage employment to Mexico, with less migration into, and less investment, production, and employment within, the state.

IV. The Impact on Latinos

- Latinos are concentrated in labor-intensive industries which face import competition from economies like Mexico's and are less represented in export industries which are likely to gain from increasing exports to Mexico (Table 17). California industries in which there are considerable imports employ a disproportionate share of immigrants, whereas high-export industries also employ relatively fewer immigrants.

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[38] Levy and van Wijnbergen (1991); Robinson, et al. (1991).

- Latinos experienced a small net positive gain in employment during the 1986-1990 expansion of California-Mexico trade. Latino net job gains represented 22% of the net job gains in the state. Latinos, however, were disproportionately the most adversely affected from job losses, suffering over 28% of the total job loss, while receiving slightly less than 27% of the new jobs created.

- Latinos will receive small net positive gains in employment (+9,120) over a five-year period as a result of a "NAFTA-Plus" scenario with increased capital flows to Mexico versus a base line scenario without a NAFTA. The net gain in Latino jobs represents about 26% of the total California net gain from NAFTA of about 34,300 jobs (Table 18).

- Latinos will suffer disproportionately more job losses than the California and Los Angeles populations as a whole. Out of the total job losses of 25,500 in the state, Latinos will suffer about 7,440 (29%). Latinos in Los Angeles will absorb about 6,100 job losses, which represent 23% of the state total loss, even though Latinos in L.A. are only 10% of state employment.

- Latinos will also gain employment in a NAFTA, but will participate disproportionately more in the job loss than in the job creation in the state due to NAFTA. Statewide, Latinos will gain 16,570 jobs, or 27% of the total statewide gain of 59,800. But since they lose jobs by such a larger margin, their net gain is disproportionately less than the total.

- Given total employment in California of 10 million and Latino employment of 2.3 million, the loss and gain of jobs due to NAFTA (estimated to be in the low thousands, spread over a five-year period) has a negligible impact on the overall labor market.

- Increased immigration will have more impact on the real wages of some Latino labor market segments than will trade or investment-related impacts of NAFTA.

V. Sectoral Micro-Case Studies of Industries Likely to be Adversely Affected by NAFTA

In addition to the macro level analysis conducted with the CGE framework, we conducted a series of sectoral micro case studies to provide greater detail and corroboration for our analysis. The case studies bring together detailed local industry data and results from field investigations both in Los Angeles and in border Maquila plants.

Criteria for inclusion in the sectoral case studies:

- Significant employers of Latino (especially Mexican) labor force. Latinos who make up one-third of Los Angeles labor force are not evenly distributed among industries.

- Susceptibility to trade penetration. In general, California imports products from labor intensive industries.

- Evidence of cross-border/off-shore production. A number of industries have already established supply, assembly or twin plants in Mexico and elsewhere.

- Possible susceptibility to environmental regulations. Due to the stringent anti-pollution regulations promulgated by the Air Quality Management Board (AQMD), arising from the poor air quality in the Los Angeles basin, a number of firms have indicated that they left the region (or plan to leave the region) to avoid the regulations.

Apparel Industry in Los Angeles

- Despite national indications that the apparel industry, as a low-wage, labor-intensive industry, may lose jobs to Mexico, that does not seem to be the case for the industry in Los Angeles.

- The Los Angeles apparel industry differs from the nation with regard to the mix of component industries — nearly 3/4 of the L.A. apparel industry employment is in Women's Wear (72,000 employees), in contrast to approximately 1/4 for the rest of the nation (Figure 21).

- The nature of the apparel industry in Los Angeles contributes to its remaining there. As the style and marketing center for the nation in the fast-changing Women's sportswear and casual wear field, it requires close linkages among design, production, and marketing which encourages the clustering of the industry in Los Angeles.

- The Los Angeles apparel industry displays remarkable continued growth while declining nationwide (Figure 22). Los Angeles County alone now accounts for nearly 10% of all apparel employment in the nation, and 22% of all Women's Wear employment.

- Apparel is one of the largest industries in Los Angeles, accounting for nearly 1/3 of the total nondurable manufacturing employment in Los Angeles — almost 100,000 on-the-books employees. This accounts for 3/4 of all California apparel employment.

- At the same time that apparel imports to California increased, so have apparel exports to Mexico — in effect, it appears to be a case of complementary rather than competitive trade.

- Interviews with Los Angeles firms suggest that the quality of apparel assembly is better in the Los Angeles area than in Mexico for the types of specialties that are strong in Los Angeles.

- Apparel firms are geographically concentrated in Los Angeles, and the areas are surrounded by Latino workers (Figure 23). The industry overwhelmingly employs women immigrants — Mexicans accounted for nearly one-half the labor force in 1980.

- Apparel firms are predominantly small, with relatively low barriers to entry. Subcontracting by major manufacturers is a key aspect of its industrial organization. More than 3/5 of the establishments have less than 20 employees and about 80% have less than 50 employees.

- Los Angeles official average wages were $6.90/hour in December, 1991 — similar to the U.S. average ($6.86) and a bit higher than California as a whole ($6.77). But this official average does not take into account off-the-books sweatshop employment.

- A significant portion of the employment is off-the-books, with informed estimates suggesting an additional 25,000 unrecorded workers. Wages in sweatshops are piece-rate and consequently, often below the minimum wage.

- In the post-1982 recession period, apparel employment grew more in Los Angeles than all apparel maquilas along the entire border (Figure 24).

Furniture Industry in Los Angeles

Overall, furniture followed the general manufacturing employment trends of the region, but it experienced a more severe job loss in the latter part of the decade. In comparison to the nation, furniture lost employment at a much greater rate in Los Angeles (Figure 25).

- In contrast to the Los Angeles apparel industry experience, the furniture industry lost jobs. Since 1987, the Los Angeles furniture industry has lost approximately 25% of its employment, dropping from over 40,000 employees to less than 30,000 in 1991 (Figure 26). The rest of California had an additional 20,000 furniture jobs.

- Segments of the Los Angeles Furniture industry have lost jobs and firms not only to Mexico, but to other parts of the U.S. as well. These tend to be smaller, marginal firms that are particularly vulnerable to the increased costs of AQMD compliance and increased workers' compensation.

- Three-quarters of the production workers are immigrant, with Mexicans making up about one-half of the immigrant workers, according to the 1980 census. Many of the furniture industry sites are located in high immigration areas (Figure 27).

- The continued decline will likely continue for another year or two, as the remaining pool of marginal local firms continues to seek locational alternatives. A key point, however, is that the major movement appears to have already taken place — prior to the Free Trade Agreement.

- The Furniture industry is made up of distinct sub-sectors such as Wood Household Furniture (8,000 emps.); Upholstered Wood Household Furniture (5,000 emps.); Metal Household Furniture (4,500 emps.); Wood Office Furniture (3,000 emps.); Office Furniture, except Wood (2,500 emps.); and Partitions and Fixtures (4,000 emps). (1989 employment data.)

- The significance of industry sub-sectors for assessing the impact of NAFTA is that each sub-sector has a distinct industrial organization/corporate structure with differing economic performance and varying susceptibility to factors such as South Coast AQMD regulations.

- The wood-based, low-cost furniture industry is the most sensitive to AQMD pollution controls. Higher profit margin, high quality wood furniture firms are more likely to be able to pass on (or absorb) the costs, without significantly affecting their competitiveness. The much bulkier upholstered furniture, which is not as likely to confront significant AQMD regulations, is also a less likely candidate for moving very far from its consumer market.

- The furniture industry in Los Angeles is made up of many smaller firms than is the case nationwide, and thus is more vulnerable to externally imposed production costs such as the higher worker compensation rates and adaptation to AQMD material use, equipment, and procedural requirements.

- Approximately 15% of the border maquilas, accounting for 5,300 jobs, are furniture manufacturers with Southern California parent companies. Overall, there are nearly 25,000 workers in border maquila furniture factories.

- Although some L.A. firms have migrated across the border, others have consciously remained in Los Angeles because of difficulties arising from cross-border production.

- According to some manufacturers, high-end furniture production, which requires higher skills, is unlikely to go to Mexico because employers indicate that quality control has been a problem in maquila furniture plants.

Electronics Industry in Los Angeles

- Electronics is a difficult-to-measure industry because it includes sub-sectors from several major industry sectors: computer equipment; communication equipment; electronic components; and measuring/controlling devices. Using this Employment Development Department definition, Los Angeles had approximately 52,000 employees in 1991 (but California had a much larger number, 340,000). However, it should be noted that search and navigation equipment, a sector with 59,000 employees in Los Angeles itself, is grouped with the aerospace sector, despite its intense inputs and creation of electronics devices. This sector had 97,000 employees statewide.

- About 800 establishments make up electronics in Los Angeles, with nearly half the industry made up of very small establishments (less than 20 employees). By contrast, the search and navigation segment (with 7,000 more employees than the electronics sector) is a much more concentrated industry: it has less than 70 establishments, a quarter of which have more than 500 employees.

- Overall, the two broad sectors of Electronics/Electrical Equipment (SIC 36) and Instruments (SIC 38) account for about 140,000 jobs in Los Angeles — not all of which are directly related to electronics. California had 466,000 in the two sectors combined. These two sectors account for 1,600 establishments in Los Angeles County (Figure 28).

- In general, employment in electronics, electronic components, and electronic instruments in Los Angeles grew as part of the defense buildup in the period through 1987. However, since then the broader industry grouping has lost some 43,000 jobs — a decline of nearly one-quarter (Figure 29).

- For purposes of comparison, the electronics industry is easier to track in the U.S. or L.A. than in Mexico because the data are more detailed in the U.S. classification system. Unfortunately, the Mexican data blur some categories and thus comparisons are more difficult.

- It is estimated that the major devolution of low-wage/low-skill electronics assembly and production to off-shore sites has already taken place, both by large multinational U.S. firms as well as by smaller firms. Consequently, the production relationship, and the location of production, is not expected to result in any drastic changes as a result of the Free Trade Agreement.

- The electronics industry is one of the most internationalized industries. U.S. firms already employ 75% more production employees in offshore plants throughout the world than in the U.S. (40% of the employees in domestic firms are production workers in contrast to 80% in offshore plants.)

- All border maquilas accounted for only 47,000 jobs in electronics in 1990 — representing a small fraction (1.7%) of total employment in the United States.

- Assemblers of electronics, instruments, and electrical items are the largest employment sector of border maquilas linked to Southern California firms, accounting for about 2/5 of the maquila employment (15,800 jobs).

- As a consequence of fewer assembly plants in the Los Angeles area, and consequently a smaller proportion of low-skilled assemblers, average industry wages tend to overstate wage rate comparisons: $12.67/hr. in Los Angeles versus $1/hr by the maquilas.

- There appears to be a general linkage between maquila electronics employment and Los Angeles electronics employment. Maquilas grew as expansion took place in Los Angeles, taking the lower-skilled assembly work from the region. However, maquilas continued to grow during 1988 and 1989 while both Los Angeles and the nation lost employment, but in 1990 employment slipped in the electronics maquilas as well (Figure 30).

- In Los Angeles, the industry consists of both large firms and many small suppliers of components. The subcontracting relationship extends not only to the concentrations of electronics companies in the west San Fernando Valley and in Orange County, but includes maquilas. Large maquila employers include Hughes, Teledyne, and Emerson.

Food Product (Processing) Industry in Los Angeles

Both Los Angeles and U.S. food processing employment dropped about 8% between 1979 and the mid-eighties, and both have since gradually grown, but not quite to the previous 1979 levels (Figure 31).

- The industry as a whole in Los Angeles consists of a diverse variety of sub-industries, ranging from baked goods to beverages to meat processing to canned and frozen specialty items.

- Bakery products (10,000 employees) and miscellaneous food products — e.g., Chinese noodles, spices, tofu, tortillas (11,000 employees) — are more significant parts of food processing in Los Angeles than the nation as a whole.

- The anticipated impact of NAFTA on food processing is expected to be greater in those areas of the state more proximate to agricultural production than in Los Angeles. For similar reasons, there are few maquilas with a relatively small employment level (Figure 32).

- Overall, food processing has a fairly high average wage both in Los Angeles and California ($12/hour), while the maquila compensation is about 75¢/hour.

- Food processing has approximately 700 establishments, of which nearly half are under twenty employees. Smaller firms prevail, with less than 2% of the firms having over 500 employees. The firms are somewhat clustered in areas of high Mexican residential concentration (Figure 33).

- In 1991, food products employed about 50,000 workers in Los Angeles (and 185,000 in California), many of whom are Latino. Over one-half of the production workers were immigrant in 1980, with Mexicans accounting for nearly a third of the immigrant workers.

- Both Los Angeles and U.S. food processing employment dropped about 8% between 1979 and the mid-eighties, and both have since gradually grown, but not quite to the previous 1979 levels.

- The obvious crucial linkage in food processing is the access to the raw materials. Government-instituted changes in Mexican agriculture and the provisions of the free trade agreement may be a crucial determinant. The Green Giant model of shifting food processing to agricultural regions of Mexico is very likely.

- It is unlikely that domestic beverages, such as beer, which have large plants in place, will find it advantageous to move across the border.

- Similarly, baked goods with relatively short shelf lives will also very likely remain in the region, unless stringent AQMD requirements (which do not take into account the pollution resulting from the transport of goods produced elsewhere) come to bear on bakeries.

- Fresh meat processing, which is particularly sensitive to USDA standards, will remain in the region.

Additional California/Los Angeles Manufacturing Industries That Should Be Investigated:

	Employment	
	Los Angeles	**California**
Textiles	10,000	15,000
Printing	59,000	160,000
Chemicals	27,000	73,000
Plastics	27,000	60,000
Fabricated Metal	57,000	123,500
Auto Parts	10,000	20,000

Additionally, detailed analysis of subsectors in Electronics and Food Processing would be of use.

VI. Key Challenges and Policy Recommendations

The recent debate on the formation of a North American Free Trade Agreement (NAFTA) has concentrated on the impact on wages, employment, and the environment in the U.S. Research over the past two years indicates that the formation of an FTA, by itself, has little effect on the U.S. economy. A free trade agreement, by itself, also will not resolve many of the fundamental problems that have impeded Mexican growth and development over the last decade. These problems relate more to factor markets than to commodity markets, involving issues of labor migration, capital movements, and the foreign debt overhang. However, if the creation of an FTA is accompanied by additional policies which enable Mexico to resolve some of these problems and shift to an open development strategy with increased trade, investment, and productivity growth, then analysis indicates that both the U.S. and Mexico gain significantly. Given its current relationships with Mexico and its dependence on foreign trade, California would gain a great deal.

Macro Policy Considerations

- If NAFTA succeeds, along with other complementary policies to assure a sustained Mexican economic recovery, this is positive for Mexico as well as for California and the U.S. as a whole. The short to medium term outlook is for a U.S. trade surplus with Mexicans who spend more of their

income on U.S. goods than any other country, and a net creation of U.S. manufacturing jobs. Job creation in Mexico will, under these circumstances, relieve migration pressure on the U.S.

- If, on the other hand, free trade is immediately imposed in all sectors, then there will be severe structural adjustment problems in Mexico. Our research, and that of others, indicates that if free trade in agriculture is adopted, U.S. corn farmers would gain because their exports to Mexico would increase, but would damage 2.5 million poor Mexican subsistence maize farmers who now are heavily protected and subsidized. The result would be increased migration out of the Mexican countryside to the cities, increased migration to the U.S., and lower real wages of unskilled urban workers in both countries.

- Rejecting any type of a NAFTA and closing off trade with Mexico, however, would in many ways be the worst of all possible scenarios. Mexico would not be able to sustain its current recovery and the U.S. would forfeit the economic (and employment) gains from increased trade due to the potentially dramatic growth of our third largest trading partner. Mexican real wages and employment would continue to fall as they did in the early 1980s, and migration pressures could only increase as Mexico faces further demographic growth for the rest of the century.

- The initial large differences in income highlight problems of reconciling labor and environmental standards across the region, especially the need for integrated government investment and regulatory policies. Migration is very sensitive to labor market conditions in both countries, as well as to differences in incomes between the two countries. Capital flows are potentially sensitive to environmental standards, as well as to differences in economic conditions. The costs of achieving integrated labor and environmental standards will be relatively higher for Mexico, the poorest of the three countries, and require public infrastructure investment to provide an environment conducive to complementary private sector investment.

- Mexico starts with a debt overhang of around $100 billion, which is the second highest (after Brazil) among developing countries. No other developing country which has made a successful transition to an open development strategy started with such a large debt burden. Turkey, which faced a debt crisis in 1978 and also shifted to an outward-oriented development strategy, provides an interesting comparator. Mexico's debt overhang, however, is far larger.

- After a decade of crisis management and policy focus on stabilization, Mexico has neglected its physical and social infrastructure, and must generate renewed investment in social overhead capital. Such social investment is necessary to complement private investment, which together are required to generate productivity growth. Achieving rapid productivity growth, in turn, is a crucial element determining the success of the new development strategy.

- Taking advantage of the opportunities provided by increased integration in North America requires that the economies be able to reallocate labor and capital within and across sectors. To achieve these reallocations quickly and efficiently, policies are needed to minimize the adjustment costs that necessarily accompany displacement of labor and capital. In the U.S., there should be funding of trade adjustment assistance which will help retrain displaced workers for new jobs.

- Establishing an FTA is a necessary part, but only a part, of the policy package that will enable Mexico to shift its development strategy. If the new strategy is to succeed, Mexico's domestic and foreign capital needs will expand greatly. It will need to mobilize resources for a major investment effort, and be able to re-enter world capital markets. Unfortunately, the next decade is projected to be characterized by increasing shortages of international capital. The creation of

an FTA may well improve confidence for private investors, including Mexicans who have maintained large investments abroad during the last decade. Under existing institutional arrangements, however, and given Mexico's debt overhang, more will be needed, especially to finance large-scale social overhead investments.

Employment Policy Considerations

- Workers in low-skill, low-wage production are more vulnerable. In general, low-skill, low-wage manufacturing firms, and industries in which a portion of production involves lower skill, lower wage workers, are the most likely to find the establishment of Mexican production sites most suitable in the short run.

- Increased Mexican immigration to California may lead to displacement of current low-wage workers. Numerous studies have indicated that the privatization and greater reliance on market forces in Mexico will flood the Mexican labor market — which already has high unemployment — and thus will very likely increase Mexican immigration to the United States, of which California is the largest recipient. Consequently, it is possible that existing immigrant Latino workers will be competing with new immigrants.

- Existing displaced worker programs are inadequate. Despite good intentions, targeted programs, such as Trade Adjustment Assistance (TAA) and current displaced worker programs such as Economic Dislocation and Worker Adjustment Assistance (EDWAA) have significant limitations.

  TAA requires a complex process to determine job loss due to trade impacts. TAA's focus is on trade-induced job losses requires a complex and time-consuming process to establish eligibility. TAA may be used effectively for workers in large firms that are positioned to pursue the process. However, since it appears that potentially dislocated workers are in smaller firms, it is less likely that they can avail themselves of TAA benefits in an effective and timely manner. Furthermore, TAA does not directly deal with the result of changes in the labor market, nor changes due to production shifting offshore.

  EDWAA program is slow in response and underfunded. EDWAA primarily deals with displaced workers resulting from major layoffs and plant closings, but it has numerous limitations. Advance notice is only required of larger firms (more than 100 employees) and thus many of the potentially affected workers in predominantly small-establishment industries could only gain assistance after they have lost jobs. Even with advance notification, the problems due to limited funding, limited staff, and inadequate coordination make it unlikely that EDWAA can be relied upon as a major tool to deal with dislocations. Basic changes in the labor market — i.e., an increase in immigrant workers — cannot be addressed by a program which only deals with retraining rather than job creation.

- Expand displaced worker programs to target geographic areas and industries that are most susceptible to adverse free trade effects, including increases in migration. Rather than struggling with technical and bureaucratically dominated hurdles that eventually allow only a limited number of adversely affected workers to gain access to retraining after dislocation, an alternative pro-active assistance program should be established. By making of use of industry and employment trend data and related information about migration of production offshore (or, indeed, out of state) and

immigration to an area, training and retraining assistance could be targeted to those industries and areas exhibiting the greatest vulnerability to capital and labor movement.

- Improve economic data base about industries and firm migration. It is essential that California have in place as soon as possible a public tracking mechanism to monitor employment and investment trends and flows in order to establish and modify public policies that seek to mitigate the impacts of capital and labor movement.

- For the longer run, focus public investment policy to develop a high-productivity, high-wage labor force. Unless there is a concerted effort to upgrade the education and skills of the growing immigrant labor force combined, and a concomitant effort to facilitate and assist existing and emerging high-wage and high-productivity industries, we will find the region ever more susceptible to global economic pressures to compete on the basis of low wages rather than productivity and innovation.

Methodological Appendix: The Cal-NAFTA CGE Model

The Cal-NAFTA CGE model is an 11-sector, four-country, computable general equilibrium (CGE) model composed of three single-country CGE models (of Mexico, California, and the rest of the U.S.) linked through trade and migration flows, plus a set of export-demand and import-supply equations to represent the rest of the world. The model is an extension of an earlier CGE model of the U.S. developed at the U.S. Department of Agriculture (USDA). A three-country (U.S., Mexico, and rest of world) extension of the USDA/CGE model was initially developed by Hinojosa and Robinson (1991), who also introduced the use of domestic and international migration functions. That model was extended by Robinson *et al.* (1991) to include an explicit modeling of domestic farm programs in both the U.S. and Mexico. The Cal-NAFTA model is very close in structure to the model by Robinson *et al.*, but adds an additional "country," California, with special treatment.

The model's 11 sectors include four farm and one food processing sector. The corn sector refers to corn used for human consumption. In Mexico, this includes white corn, the small proportion of yellow corn used for food, and No. 2 yellow corn imports from the U.S., which are assumed to enter food use. In the U.S., the food corn sector refers to No. 2 yellow corn, which is an export quality. The composition of the program crops sector corresponds to the other crops eligible for U.S. deficiency payments — feed corn, food grains, soybeans, and cotton. Other agriculture includes livestock, poultry, forestry and fishery, and other miscellaneous agriculture. The fruits and vegetables sector in Mexico includes beans; a major food crop.

There are six primary factors in the model, including four labor types, capital, and agricultural land. The four labor types are rural, urban unskilled, urban skilled, and professional. The base year for Mexico is mostly 1988.[39] The U.S. and California use a 1987 base year because of the severe contraction of agricultural output following the 1988 drought. Bilateral trade flows are from 1988. Because of the volatility in U.S. 1987-88 agricultural output, the model follows Adams and Higgs (1986) and Hertel (1990) in the use of a "synthetic" base year for the U.S., imposing 1988 U.S.-Mexican bilateral trade flows on a 1987 base U.S. economy. This approach has the advantage of achieving a more representative U.S. base year, with minimal adjustment to the data.[40] Tariffs and tariff equivalents of quotas are 1988 trade-weighted rates.

The core model follows the standard theoretical specification of trade-focused CGE models.[41] Each sector produces a composite commodity that can be transformed according to a constant elasticity of transformation (CET) function into a commodity sold on the domestic market or into an export. Output is produced according to a CES production function in primary factors, and fixed input-output coefficients for intermediate inputs. The model simulates a market economy, with prices and quantities assumed to adjust to clear markets. All transactions in the circular flow of income are captured. Each country model

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[39] The data base is documented in Burfisher, Thierfelder, and Hanson (1992). Hinojosa developed the data on employment structure. Some of the Mexican agricultural support data refer to 1989. The Mexican agricultural programs have changed dramatically over the past few years, and it is important to use the latest data available.

[40] A comparison of 1987 and 1988 U.S.-Mexico trade shows that Mexican farm imports increased in 1988 as U.S. agricultural output fell. Use of a 1987/88 split year for the U.S. moderates the importance of Mexico in U.S. agricultural trade relative to 1988.

[41] See the appendix for a complete equation listing. Robinson (1989) and de Melo (1988) survey single-country, trade-focused, CGE models. The FTA-CGE model is implemented using the GAMS software, which is described in Brooke, Kendrick, and Meeraus (1988).

traces the flow of income (starting with factor payments) from producers to households, government, and investors, and finally back to demand for goods in product markets.

Consumption, intermediate demand, government, and investment are the four components of domestic demand. Consumer demand is based on Cobb-Douglas utility functions, generating fixed expenditure shares. Households pay income taxes to the government and save a fixed proportion of their income. Intermediate demand is given by fixed input-output coefficients. Real government demand and real investment are fixed exogenously.

In factor markets, full employment for all labor categories is assumed. Aggregate supplies are set exogenously. The model can incorporate different assumptions about factor mobility, and various labor markets are linked by migration flows (described further below). The results should be seen as reflecting adjustment in the long-run, with capital able to leave the agricultural sectors.

There are three key macro balances in each country model: the government deficit, aggregate investment and savings, and the balance of trade. Government savings is the difference between revenue and spending, with real spending fixed exogenously but revenue depending on a variety of tax instruments. The government deficit is therefore determined endogenously. Real investment is set exogenously, and aggregate private savings is determined residually to achieve the nominal savings-investment balance.[42] The balance of trade for each country (and hence foreign savings) is set exogenously, valued in world prices. In the case of California, the balance of trade for California and the U.S. together is assumed fixed, but it is not fixed for each separately. Similarly, the exchange rate between the U.S. and California is assumed fixed.

Each country model solves for relative domestic prices and factor returns which clear the factor and product markets, and for an equilibrium real exchange rate given the exogenous aggregate balance of trade in each country. The GDP deflator defines the numeraire in each country model, and the currency of the rest of the world defines the international numeraire. The model determines two equilibrium real exchange rates, one each for the U.S. and Mexico, which are measured with respect to the rest of the world. The cross rate (U.S. to Mexico) is implicitly determined by an arbitrage condition. Of course, the U.S.-California exchange rate is fixed at one, so the California-Mexico exchange rate is the same as the U.S.-Mexico rate.

The model specifies sectoral export supply and import demand functions for each country, and solves for a set of world prices that achieve equilibrium in world commodity markets. At the sectoral level, in each country, demanders differentiate goods by country of origin and exporters differentiate goods by country of destination. In the commodity markets, California is treated as a separate country, with relative prices that may differ from the rest of the U.S.

[42] Enterprise savings rates are assumed to adjust to achieve the necessary level of aggregate savings in each country. In the CGE literature, this treatment is known as Johansen macro closure, after Lief Johansen, who used it in the earliest single-country CGE model.

Import Demand Equations

The standard approach in trade-focused CGE models is to assume that domestic and imported goods are imperfect substitutes and to specify a constant elasticity of substitution (CES) import aggregation function.[43] In the case of a multi-country model, the function aggregates imports from all countries of origin. In the simplest case, the CES function is extended to include goods from many countries, with the substitution elasticity assumed to be the same for all pairwise comparisons of goods by country of origin.[44] The first-order conditions define import demand as a function of relative prices and the elasticity parameter.

The use of CES functions in multi-country Armington trade models has led to empirical problems due to the restrictive nature of the CES functions. Instead of the CES import aggregation function, we use import demand equations based on the Almost Ideal Demand System (or AIDS).[45] The AIDS function is a flexible functional form in that it can generate arbitrary values of substitution elasticities at a given set of prices, and also allows expenditure elasticities different from one.

In the AIDS approach, the expenditure shares are given by:

$$S_{i,k,c1} = \alpha_{i,k,c1} + \sum_{c2} \gamma_{i,k,c1,c2} \log(PM_{i,k,c2}) + \beta_{i,k,c1} \log\left[\frac{\bar{C}_{i,k}}{P_{i,k}}\right] \qquad (1)$$

where subscript i refers to sectors; subscript k refers to the U.S., California, and Mexico; and subscript c1 refers to the U.S., California, Mexico, and the rest of the world. $S_{i,k,c1}$ is the expenditure share on imports of good i into country k from country c1. $\bar{C}_{i,k}$ is nominal expenditure on composite good i in country k, $PM_{i,k,c2}$ is the domestic price of imports, and $P_{i,k}$ is the aggregate price of the composite good. The Greek letters are parameters.

We adopt the notation convention that when k = c1,

$M_{i,k,k} = D_{i,k}$, $PM_{i,k,k} = PD_{i,k}$, and $S_{i,k,k} = \dfrac{PD_{i,k} \cdot D_{i,k}}{\bar{C}_{i,k}}$

where $M_{i,k,c1}$ is the import of good i into country k from country c1, $D_{i,k}$ is the domestically produced good sold on the domestic market, and $PD_{i,k}$ is the price of $D_{i,k}$. Deaton and Muellbauer (1980) define the aggregate price index, $P_{i,k}$, by a translog price index. In econometric work, the translog price index is often approximated by a geometric price index. We use the translog index in the Cal/NAFTA model.[46]

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[43] The properties of single-country CGE models incorporating CES import aggregation functions have been extensively studied. See, for example, de Melo and Robinson (1989) and Devarajan, Lewis, and Robinson (1990).

[44] Other generalizations of the CES function could allow different, but fixed, elasticities of substitution between goods from different countries. See, for example, the CRESH function described in Dixon *et al.* (1982). It is also common to use nested CES functions, with a two-good CES function specifying substitution between domestically produced goods and a composite of imports, which is itself a CES function of goods from various countries of origin.

[45] The AIDS specification in this model draws heavily on work by Robinson, Soule, and Weyerbrock (1991). The discussion below is based on their paper.

[46] The geometric price index is usually called a Stone index. Robinson, Soule, and Weyerbrock (1991) analyze the empirical properties of different import aggregation functions in a three-country model of the U.S., European Community, and rest of world, which is a close cousin of the Cal-NAFTA CGE model. Green and Alston (1990) discuss the computation of various elasticities in the AIDS system when using the Stone or translog price indices.

Various restrictions on the parameters are required to have the system satisfy standard properties of expenditure functions such as symmetry, homogeneity, adding up, and local concavity. We calibrated the parameters for the Cal/NAFTA model by starting from a set of expenditure elasticities and substitution elasticities for each sector in each country. We specified higher substitution elasticities for goods traded between the U.S. and California, and lower elasticities for trade with Mexico and the rest of the world.[47]

Migration

The Cal/NAFTA model specifies a number of labor migration flows: rural Mexico to rural U.S. and rural California; urban unskilled Mexico to urban unskilled U.S. and California; internal migration within Mexico from rural to unskilled urban labor markets; and migration between rural and urban unskilled between the U.S. and California. Migration is assumed to be a function of wage differentials between the linked labor markets. In equilibrium, migration levels are determined which maintain a specified ratio of real wages, $wgdf_{mig}$, for each labor category in the countries, measured in a common currency, and a specified ratio of real wages between the rural and unskilled urban markets in Mexico:

$$WF_{mig,mx} = wgdf_{mig} \cdot WF_{mig,us} \cdot \frac{EXR_{mx}}{EXR_{us}} \qquad (2)$$

where the index *mig* refers to the three migration flows, WF is the wage, and EXR is the exchange rate. Migration between the U.S. and California (and within Mexico) follows a similar specification, except that the exchange rate is fixed at one. The domestic labor supply in each skill category in each country is then adjusted by the migrant labor flow.

An implication of this specification of Mexican-U.S.-California migration flows is that real wages measured in a common currency are equated, but they can grow at different rates measured in the domestic currency. It is therefore possible to observe migrants between Mexico and the U.S./California moving from a labor market where real wages are rising to one in which they are falling in domestic currency terms. 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 the exchange rate. On the other hand, if they are motivated by observations on relative changes within the two economies then migration could be expected to be insensitive to the exchange rate. The model probably overstates the sensitivity of migration to the exchange rate, generating a backward flow of migrants into Mexico when the Mexican peso appreciates.

Migration flows generated by the Cal/NAFTA model refer to changes in migration from a base of zero. They should be seen as additional migration flows due to the policy change, adding to current flows. Current migration flows are substantial, both within Mexico and between Mexico and the U.S.[48] In addition, the net migration flows generated by the model represent workers, or heads of households. In recent years, a substantial share of migrants have been family members. The model thus probably understates total increased migration due to a policy change, since family members will tend to migrate with workers.

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[47] We drew on work at the International Trade Commission for estimates of the various elasticities. See Reinert and Shiells (1991) who present estimates of substitution elasticities. They are currently working on estimating AIDS functions.

[48] Various researchers have placed the net increase of undocumented Mexican immigrants in the U.S. to be around 100,000 a year during the 1980s. See Bean, Edmonston, and Passel (1990).

Agricultural Programs

In both the U.S. and Mexico, the agricultural sector is characterized by a complex set of trade policies and domestic agricultural programs. These policies distort production, consumption and trade, and require significant fiscal expenditures in both countries. Mexican agricultural program expenditure in 1988, totaling $1.6 billion, represented over one-half of total national subsidy expenditure, and equaled almost one percent of GDP.[49] In the U.S., deficiency payments and expenditures on the export enhancement program (EEP) in 1987 totalled $11.5 billion, or one percent of government spending and 10 percent of the fiscal deficit.

In the Cal/NAFTA model, agricultural policies are modeled either as price wedges, which affect output decisions, or lump-sum income transfers. The wedges and transfers are either specified exogenously or determined endogenously, based on the institutional characteristics of the program being modelled.[50] California is assumed to have the same agricultural policies as the rest of the U.S.

Border policies (tariffs, quotas, and export subsidies) affect producers through their effect on the output price, $PX_{i,k}$, which is effectively a weighted average of the prices of output sold in the domestic market, $PD_{i,k}$, and in each export market, $PE_{i,k,cl}$. Similarly, they affect consumers through the price of the composite good, $P_{i,k}$, which is effectively a weighted average of the domestic currency price of the imported good, $PM_{i,k}$, and the domestic good price, $PD_{i,k}$.[51] Given the CET and AIDS functions, the link between trade policy and domestic prices is weaker than in a model where all goods are perfect substitutes.

Mexican Agricultural Programs

Six Mexican policies are modeled.[52] In the four agricultural sectors, these are input subsidies, tariffs, and quotas. In the food processing sector, we model direct subsidies and price subsidies, in addition to tariffs and quotas. The sixth Mexican policy is the low income, or tortilla, subsidy.

Mexico provides its farmers with input subsidies on credit, fertilizer, insurance, irrigation, and feed. Input subsidies are represented in the model as a per-unit mark-up on output price measured as a fixed number of pesos per unit of output.[53] Reflecting their effect on the producer's output decision, input subsidies are summed into a Producer Incentive Equivalent ($PIE_{i,k}$), in pesos per unit of output. For the U.S. and Mexico, the producer incentive equivalents in *ad valorem* terms range from 16 to 21 percent (Tables 3 and 4). Given the assumption of fixed input-output coefficients, the profit maximization problem uses the value added-price ($PVA_{i,k}$) in computing the marginal revenue product as an argument to determine demand for primary factors. PVA is the price received by producers (PX, defined net of indirect taxes), minus the cost of intermediate inputs (given by input-output coefficient, $IO_{j,i,k}$), and plus all subsidies (PIE):

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[49] This total represents agricultural expenditures for 1989 and subsidies to food processing for 1988.

[50] The policies are modelled as in the U.S.-Mexico model by Robinson *et al.* (1991), where the policies are described in detail.

[51] PX is a CET aggregation of PD and PE, while P is a translog or Stone aggregation of PD and PM.

[52] Mexican agricultural policies are described in Krissoff and Neff (1992); Burfisher (1992); Mielke (1989, 1990); O'Mara and Ingco (1990); and Roberts and Mielke (1986).

[53] Input subsidies can be tied directly to output because intermediate demand is modeled with fixed input-output coefficients. With more complex production functions, input subsidies should be directly tied to input usage. A "u" as the final letter in the name of a subsidy signifies that it is provided per unit of output.

$$PVA_{i,k} = PX_{i,k} - \sum_{j} (IO_{j,i,k} \cdot P_{j,k}) + PIE_{i,k} \qquad (3)$$

Increasing the producer's value-added price with a positive PIE increases factor returns and induces a resource pull of factors toward the subsidized sector, causing output in the sector to expand.

Import quotas in agriculture are used by the Mexican government as a supply management tool to maintain targeted domestic farm prices. Import licenses are generally issued after the domestic crop has been harvested and purchased. To acquire a license, private importers or Mexico's food parastatal, the Compania Nacional de Subsistencias Populares (CONASUPO), must show that domestic supplies are being purchased for not less than the government target price. Mexico is assumed to be a small country in the world market for its agricultural imports, so that their quotas do not affect the world price. The tariff equivalent of the quota, $TM2_{i,k,c1}$, can be calculated as the "price-gap" between the world price and the domestic price. Following Dervis, de Melo, and Robinson (1982) and Kilkenny (1991), $TM2_{i,k,c1}$ is determined endogenously, so that the quota's *ad valorem* equivalent (and hence the value to license holders of the import premia) changes with the price gap.

Premium income from each sector is distributed to the holders of import licenses. Since only Mexicans are awarded licenses, the rent is retained domestically. In the Cal/NAFTA model, the rent is allocated between government revenue and enterprise income according to the share of the government and private sector in imports.[54] Tariffs are modelled with fixed *ad valorem* rates, $TM_{i,k,c1}$, and tariff revenues are paid by consumers to the government.

Since December 1987, Mexico has placed price controls on almost all basic foods, including corn products, wheat products, dairy, eggs, poultry, and pork. To enable food processors to sell their output at low consumer prices fixed by price controls, the government offsets processors' high input prices with two types of subsidies. One is a direct subsidy, $DSUB_{i,k}$. This is a modeled as a fixed budgetary transfer from the government to the processing sector, with a unit value ($DSUBU_{i,k}$) that varies with a change in output:

$$DSUBU_{i,k} = \frac{DSUB_{i,k}}{XD_{i,k}} \qquad (4)$$

where $DSUBU_{i,k}$ is included in the $PIE_{i,k}$ price wedge on producer's value-added price, and the direct subsidy expenditure is treated as a fixed component of Mexican farm program expenditures.

The Mexican government also provides processors with an input price subsidy, $PSUB_{i,k}$, to compensate them for the high purchase price of domestic agricultural inputs, and to enable them to sell their output on the domestic market at the controlled retail price $\bar{P}_{i,k}$. $PSUBU_{i,k}$ is the input price subsidy in pesos per unit of output. Its initial value is calculated from data on sectoral government expenditures on price subsidies, $PSUB_{i,k}$, and domestic sales, $D_{i,k}$ as:

[54] Tariffs and quotas are modelled identically for the U.S. and Mexico, except that in the U.S., quota premia accrue to capital income.

$$PSUBU_{i,k} = \frac{PSUB_{i,k}}{D_{i,k}} \quad (5)$$

Price subsidies increase a processor's domestic sales price to $PDA_{i,k}$, the "actual" domestic sales price received by each producer:

$$PDA_{i,k} = PD_{i,k} + PSUBU_{i,k} \quad (6)$$

In a model with more sectoral disaggregation, the unit price subsidy should be modeled endogenously as the price wedge on a processor's domestic sales price that is required to maintain the fixed retail price of the composite good, $P_{i,k}$. Because the 11-sector model aggregates all food processing into a single sector, $PSUBU_{i,k}$ is represented as a fixed price wedge and consumer food prices are permitted to vary. Quota removal under an FTA is simulated by simply removing the wedge, rather than allowing the model to determine the change in $PSUBU_{i,k}$. The cost of the price subsidy to the government increases with an increase in domestic sales, and is included in agricultural program expenditures.

Mexico provides low income consumers with subsidized corn tortillas. Under one program, low prices are offered in CONASUPO-owned retail outlets located in low-income neighborhoods. More recently, the government has provided low-income households with one kg. per day of tortillas, approximately one-half the daily average household consumption [Levy and van Wijnbergen (1991)]. Since the Cal/NAFTA model has only a single aggregate household, with no differentiation by income, the tortilla subsidy is represented as a lump-sum income transfer to the single household. Similar to direct subsidies to processors, expenditure by the government on low income corn subsidies, $LOSUB_{i,k}$, is fixed and enters into Mexican agricultural program expenditures.

U.S. and California Agricultural Programs

Two U.S. farm programs could be affected by an FTA — deficiency payments and the EEP.[55] The U.S. deficiency payments program provides payments to farmers who participate in feed grain, wheat, rice, or cotton programs. The payment rate is calculated as the difference between a fixed target price ($TP_{i,k}$) and the market price ($PX_{i,k}$) or loan rate, whichever difference is less. The total payment a farm receives ($DEFPAY_{i,k}$) is the payment rate multiplied by eligible base production ($XP_{i,k}$):[56]

$$DEFPAY_{i,k} = \left(TP_{i,k} - PX_{i,k}\right) \cdot XP_{i,k} \quad (7)$$

The U.S. EEP program is intended to counter competitors' subsidies and other "unfair" trade practices in targeted U.S. agricultural export markets, and to develop, expand, or maintain foreign markets. Under

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[55] Our modeling of these programs in the Cal-NAFTA model follows Kilkenny and Robinson (1988, 1990) and Kilkenny (1991).

[56] The initial value of the target price is calculated from base-year data on the aggregate cost of deficiency payment (DEFPAY) which is then used to estimate the mark-up on the market price. The model also implicitly fixes participation rates at the base year rate, implying that any increase in U.S. program crop output comes from outside the deficiency payments program. In recent years, the market price has been above the loan rate, so we have not had to model the non-recourse loan program.

the EEP program, the USDA approves an initiative to permit an importing country to tender for a specified quantity of a designated commodity. Exporting firms bid for the sale, which are contingent on receiving an EEP bonus from the Commodity Credit Corporation (CCC). EEP bonuses are fungible, in-kind certificates backed by commodities owned by the CCC. The firms estimate the per unit subsidy they will need to complete the sale and then compete against each other for the EEP bonus. The CCC then accepts one of the bids, based on the price and bonus ranges. In effect, the EEP program works as an *ad valorem* export subsidy, which is how it is treated in the Cal/NAFTA model. The subsidy rate, $TEE_{i,k,cl}$, is applied as a mark-up on the world export price:

$$PE_{i,k,cl} = PWE_{i,k,cl} \cdot EXR_k \cdot (1 + TEE_{i,k,cl}) \tag{8}$$

which allows U.S. and California producers to lower the world price of their goods relative to other suppliers, while maintaining their received price (PE). Total EEP expenditures are included in farm program expenditures.

For each country, the policy-ridden, value-added producer price becomes:

$$PVA_{i,k} = \frac{\left[(1 - ITAX_{i,k}) \cdot PD_{i,k} + PSUBU_{i,k}\right] \cdot D_{i,k} + \sum_{cl} PE_{i,k,cl} \cdot E_{i,k,cl}}{XD_{i,k}} - \sum_{j} (IO_{j,i,k} \cdot P_{j,k}) + PIE_{i,k} \tag{9}$$

where: ITAX is the indirect tax rate, PSUBU is the subsidy rate on domestic sales (by food processors in Mexico), and PIE is a bundle of subsidies in domestic currency per unit of total output. The other variables are defined above.

Four types of elasticity parameters are used in the model. The production specification requires sectoral elasticities of substitution among primary factors. The CET export supply functions require elasticities of transformation between goods sold on the home and export markets. The AIDS import demand functions require sectoral income elasticities and substitution elasticities for home goods and for goods from each import source. We have drawn on estimates and "guesstimates" from various studies, including Hinojosa and Robinson (1991); Hanson, Robinson, and Tokarick (1989); and Reinert and Shiells (1991). In lieu of econometric estimation, sensitivity analysis was carried out to check for the robustness of the model results using alternative elasticity parameters.

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Appendix:

Tables and Figures

Table 1: Measures of U.S.-Mexico Integration

	1980	1990
(Billions of Dollars)		
Mexican Exports to U.S.	$12.8	$28.4
U.S. Exports to Mexico	15.1	30.8
Value Added in in Inbound Industries	.7	3.6
U.S. Direct Foreign Investment in Mexico	5.86	19.1
External Mexican Debt	71.1	98.2
Expenditure of Mexican Travelers to the U.S.	2.5	2.6
Expenditure of U.S. Travelers to Mexico	2.5	2.1
(Thousands of People)		
Visitors from Mexico to U.S.	3,323	6,768
Mexicans Apprehended Entering Illegally to U.S.	817	1,092

Source: Banco de Mexico, INS.

Table 2: Sectoral Structure of U.S. and Mexican Economies, Base Solution

	Sectoral shares (percent) in:									
	GDP		Employment		Imports		Exports		Bilateral import barriers	
Commodity	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico
Food corn	0.0%	0.6%	0.0%	6.3%	0.0%	1.2%	0.3%	0.0%	0.0%	55.0%
Program crops	0.5%	1.0%	0.4%	5.5%	0.0%	3.3%	3.3%	0.1%	0.0%	23.1%
Fruits/Vegetables	0.2%	0.9%	0.4%	3.1%	0.4%	0.1%	0.4%	3.0%	13.2%	12.5%
Other agriculture	0.8%	4.6%	1.4%	8.9%	1.5%	1.3%	0.4%	3.8%	0.6%	8.9%
Food processing	1.7%	7.6%	1.5%	2.5%	2.3%	5.2%	2.9%	3.7%	7.0%	8.2%
Other light mfg.	4.5%	5.3%	5.1%	2.7%	16.2%	4.3%	7.0%	6.0%	4.7%	8.1%
Oil and refining	2.2%	2.5%	0.5%	0.5%	11.6%	5.0%	2.6%	10.2%	1.5%	8.8%
Intermediates	5.6%	7.9%	4.5%	3.2%	12.7%	16.7%	13.9%	12.3%	2.2%	8.0%
Consumer durables	1.8%	2.6%	1.7%	0.8%	28.4%	14.8%	10.0%	18.6%	1.8%	12.0%
Capital Goods	5.2%	3.5%	4.9%	2.2%	25.0%	26.4%	31.7%	12.0%	3.6%	12.7%
Services	77.4%	63.6%	79.6%	64.4%	1.8%	21.6%	27.5%	30.3%	0.1%	0.0%

Notes:
Bilateral import barriers are the combined rate of trade-weighted tariffs and tariff equivalents of quotas on trade between Mexico and the U.S. Percent composition columns sum to 100%, except for rounding error.

Sources:
U.S. and Mexican social accounting matrices, Robinson, Burfisher, Hinojosa, Thierfelder.

Table 3: Comparative Aggregate Data, Mexico, U.S., California, Los Angeles County

	Mexico	U.S.	California	L.A. County
GDP ($US billions, 1988)	176.7	4,847.4	610.5	174,535
Per Capita GNP ($US, 1988)	1,760	19,990	19,640	19,900
Trade Flows (percent of GDP)				
Total Exports	13.6	7.1	10.5	12.9
Exports to Partner	10.1	0.2	.7	
Total Imports	12.0	10.1	14.4	17.5
Imports from Partner	6.3	0.4	.8	
Employment Structure (percent)				
Rural Labor	13.1	1.4	3.1	0
Urban Unskilled Labor	13.6	17.3	18.9	20.3
Urban Skilled Labor	38.8	48.6	43.5	42.6
White Collar Workers	34.6	32.7	34.5	37.1
Total	100.0	100.0		
Population, Ages 15-64 (millions)	49	162	19,191	5,774
Total Population (millions)	84	246	29,142	8,786

Sources:
GDP, per capita GNP, and population data refer to 1988 and come from World Bank, World Development Report 1990. Gross State product data from Department of Finance California Statistical Abstract, 1991. All other data come from U.S. and Mexican social accounting matrices developed by the authors.

Table 4: Comparative Data for Selected Countries

Country	GDP $ billions 1989	Population millions 1989	Per capita GNP $ 1989	Growth rate 1965-89	GDP Growth 1980-89	Exports as Share of GDP (%) 1965	1989
United States	5,156.4	248.8	20,910	1.6	3.3	6	12
Canada	488.6	26.2	19,030	4.0	2.1	19	25
Mexico	200.7	84.6	2,010	3.0	0.7	8	16
Germany	1,189.1	62.0	20,440	2.4	1.9	19	35
Spain	379.4	38.8	9,330	2.4	3.1	10	19
Greece	39.9	10.0	5,350	2.9	1.6	9	24
Portugal	44.9	10.3	4,250	3.0	2.5	27	36
Yugoslavia	71.8	23.7	2,920	3.2	1.3	22	34
Turkey	71.6	55.0	1,370	2.6	5.1	6	22
Egypt	31.6	51.0	640	4.2	5.4	18	22
Chile	25.3	13.0	1,770	0.3	2.7	14	38
Colombia	49.4	32.3	1,200	2.3	3.5	11	18
Argentina	53.1	31.9	2,160	-0.1	-0.3	8	16
Venezuela	43.8	19.2	2,450	-1.0	1.0	26	34
Brazil	319.2	147.3	2,540	3.5	3.0	8	7
Japan	2,818.5	123.1	23,810	4.3	4.0	11	15
South Korea	211.9	42.4	4,400	7.0	9.7	9	34
Thailand	69.7	55.4	1,220	4.2	7.0	16	36
Philippines	44.4	60.0	710	1.6	0.7	17	25
Averages:							
Lower middle income			1,360	2.0	2.5	15	25
Upper middle income			3,150	2.6	3.2	20	24
High income			18,330	2.4	3.0	13	23

Notes:
N.A. indicates not available.

Source:
World Bank, World Development Report, 1991.

Table 5: Mexican Contribution to U.S. Population and Labor Pool

Thousands	1940	1950	1960	1970	1980	1990
(1) Total U.S. population	132,457	151,868	179,979	203,984	227,217	249,666
(2) Total Mexican population	19,654	25,791	34,923	48,225	66,847	85,782
(3) Population of Mexican origin in U.S.	377	450	1,735	4,532	8,740	13,495
(4) U.S. labor force	41,870	63,379	71,489	84,889	108,544	126,424
(5) Mexican labor force	5,858	8,345	10,213	14,489	22,092	31,027
(6) Annual flow of legal temporary workers	0	150	420	47	20	120
(7) Cumulative stock of undocumented workers (since 1940)	0	100	200	316	1,095	2,298
(8) Cumulative stock of legal immigrant workers (since 1940)	0	46	286	673	1,230	2,172
(9) Total Mexican workers in U.S. labor force	0	296	906	1,036	2,345	4,590
(10) Total labor force in U.S. of Mexican origin	335	571	1,308	2,063	3,498	8,742
Percent shares						
(11) Mexicans working in U.S. as share of Mexican labor force	0.0	3.6	8.9	7.2	10.6	14.8
(12) Mexicans working in U.S. as share of U.S. labor force	0.0	0.5	1.3	1.2	2.2	3.6
(13) Total labor force in U.S. of Mexican origin as share of U.S. labor force	0.8	0.9	1.8	2.4	3.2	6.9

Notes:
U.S. Mexican labor force totals for 1940, 1950, 1970, 1980 and 1980 are from the census data on economically active population (including unemployed). The 1960 census figure was adjusted to correct for over-counting of rural workers (for details, see Clark W. Reynolds (1979), "A Shift-Share Analysis of Regional and Sectoral Productivity Growth in contemporary Mexico," Working Paper, International Institute for Applied Systems Analysis, Laxenburg, Austria. The estimates in row (6) are based on the number of legal temporary workers, including braceros from 1942 to 1964, H-2 from 1952, and SAW/RAW from 1986. Estimates in row (7) are of undocumented workers during the previous five-year period (one quarter of undocumented immigrants deported reduced by one-fourth for non-participants in the work force) and are adjusted by estimates published by Passel and Woodrow (1984) and Garcia y Griego (1989). Row (8) is based on the INS Yearbook of Immigration Statistics, with demographic growth calculated along with a 0.68 labor force participation rate and a 0.05 attrition rate.

Mexicans in the United States refer to all legal and undocumented immigrants from Mexico who entered this country between 1940 and the present and their progeny, regardless of place of birth. This is clearly not the same as "people of Mexican origin" as described in the U.S. Census and Current Population Survey. The magnitude of the difference (about half the current total) can be explained as arising from all legal and undocumented immigrants and their descendants who came before 1940.

Table 6:

Racial Composition of Population for California

				Growth	
(Thousands)	1970	1980	1990	1970-80	1980-90
Total	19663	23511	29760	20%	27%
White	80%	68%	57%	2%	6%
Afro-American	7%	8%	7%	36%	10%
Asian	3%	8%	9%	181%	44%
Latino	11%	16%	26%	79%	102%

Racial Composition of Population for Los Angeles County

				Growth	
(Thousands)	1970	1980	1990	1970-80	1980-90
Total	7032	7477	8863	6%	19%
White	71%	53%	41%	-20%	-9%
Afro-American	11%	13%	11%	24%	5%
Asian	3%	6%	11%	138%	60%
Latino	15%	27%	36%	96%	109%

Table 7: Employment Structure, 1990

	California			L.A. County		
	Total		**Latino**	**Total**		**Latino**
TOTAL (thousands)	13,849		3,210	4,660		1,420
Agriculture	3.1%	<	7.5%	0.0%		0.0%
Self Employed	11.1%	>	7.8%	9.7%	>	5.9%
Construction	5.3%	<	6.6%	4.8%	<	6.9%
Manufacturing						
Durable	10.8%	<	12.9%	12.2%	<	15.7%
Non-Durable	5.6%	<	10.5%	8.2%	<	15.5%
Transp., Comm.	4.7%	>	3.9%	5.3%	>	4.3%
Trade	18.3%	<	21.1%	18.3%	<	22.0%
Fire	6.5%	>	3.5%	6.9%	>	4.5%
Services	20.7%	>	17.1%	22.8%	>	17.4%
Govt.	13.9%	>	9.1%	11.8%	>	7.8%

Source: Geographic Profile of Employment & Unemployment, BLS Bulletin 2381, 1991 June.

Table 8: Changes in Aggregate Trade Flows
(billions of world $)

	Experiment	Region	Exports to: Partner	Exports to: ROW	Imports from: Partner	Imports from: ROW	Balance of Trade
TYPE I Liberalization	1. Non-Ag Tariff Removal	U.S.	0.89	0.17	0.61	0.47	0.00
		Mexico	0.61	0.26	0.89	-0.06	0.00
		California	0.14	0.01	0.10	0.03	0.00
	2. Full Tariff Removal	U.S.	1.34	0.41	0.80	0.89	0.00
		Mexico	0.80	0.43	1.34	-0.12	0.00
		California	0.14	0.02	0.13	0.10	0.00
	2a. FR/VEG Phase In	U.S.	1.32	0.44	0.75	0.95	0.00
		Mexico	0.75	0.45	1.32	-0.13	0.00
		California	0.13	0.02	0.12	0.11	0.00
	3. Mexican Liberalization	U.S.	1.47	0.89	0.83	1.40	0.12
		Mexico	0.83	0.50	1.47	-0.15	0.00
		California	0.14	0.05	0.13	0.18	0.00
TYPE II Protectionism	4. Protection	U.S.	-0.09	0.44	-0.11	0.39	0.00
		Mexico	-0.11	-0.02	-0.09	0.00	0.00
		California	-0.04	0.03	-0.02	0.07	0.00
TYPE III Liberalization & Growth	5. Pro-Competative Impact	U.S.	1.96	-0.16	0.94	0.81	0.00
		Mexico	0.94	0.99	1.96	0.00	0.00
		California	0.12	0.01	0.15	0.03	0.00
	6. Mexican Growth	U.S.	4.19	-0.72	1.37	1.88	0.00
		Mexico	1.37	3.44	4.19	0.70	0.00
		California	0.15	-0.03	0.22	0.10	0.00
	7. Mexican BOT Deficit	U.S.	9.22	-5.52	-1.24	4.61	0.00
		Mexico	-1.24	-3.85	9.22	2.87	-17.85
		California	0.47	-0.48	-0.21	0.53	0.00
	8. Mexican Growth & BOT Deficit	U.S.	11.53	-6.47	-0.48	5.08	0.00
		Mexico	-0.48	-1.85	11.53	3.50	-17.85
		California	0.41	-0.50	-0.08	0.45	0.00

Notes: "Partner" is Mexico for U.S. and California and U.S. for Mexico. "ROW" is "rest of world."

Table 9: Sectoral Output and Trade Results of Alternative Scenerios

(Difference (%) From Base Run Values)

SET I: Liberalization

United States

Sector	Scenario 1 Non-Ag Tarrif Removal			Scenario 2 Full Tariff Removal			Scenario 2a FR/VEG Phase In			Scenario 3 Mexican Liberalization		
	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex
Corn	0.0	-2.7		6.5	128.8		6.5	128.6		8.2	150.8	
Ag Prod	0.0	-2.6		0.6	38.0		0.6	37.7		1.2	74.5	
Frt & Veg	-0.0	-2.3	1.1	0.1	12.8	20.8	0.2	4.1	10.8	0.3	11.0	16.8
Other Ag	0.0	-1.6	1.0	0.2	7.7	2.6	0.2	7.6	2.7	0.2	5.3	0.5
Food Proc	0.0	5.6	8.3	0.1	5.0	9.9	0.1	4.9	10.1	0.3	3.4	5.1
Light Mfg	0.0	5.8	6.9	0.1	5.3	7.8	0.1	5.2	7.9	0.2	5.0	8.4
Oil		12.5	4.4		12.4	4.5		12.4	4.5		12.2	4.6
Intrm Gds	0.1	6.2	3.8	0.2	5.7	4.5	0.2	5.6	4.6	0.3	5.1	5.2
Cnsmr Drbls	0.2	11.7	4.6	0.2	10.8	6.2	0.2	10.7	6.4	0.3	10.1	8.1
Kapt Gds	0.1	6.5	6.3	0.1	5.9	7.1	0.1	5.8	7.3	0.2	5.3	8.1
Services	0.0	-0.5	0.2	0.1	-0.6	0.4	0.1	-0.6	0.5	0.3	-0.7	0.8

Mexico

Sector	Scenario 1 Non-Ag Tarrif Removal			Scenario 2 Full Tariff Removal			Scenario 2a FR/VEG Phase In			Scenario 3 Mexican Liberalization		
	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US
Corn	-0.6		-2.7	-12.7		128.8	-12.6		128.6	-21.3		150.8
Ag Prod	0.2		-2.6	-4.9		38.0	-4.8		37.7	-13.3		74.5
Frt & Veg	0.3	1.1	-2.3	5.7	20.8	12.8	3.0	10.8	4.1	1.6	16.8	11.0
Other Ag	-0.3	1.0	-1.6	0.2	2.6	7.7	0.2	2.7	7.6	-2.1	0.5	5.3
Food Proc	-0.3	8.3	5.6	-0.2	9.9	5.0	-0.2	10.1	4.9	-3.1	5.1	3.4
Light Mfg	0.4	6.9	5.8	0.5	7.8	5.3	0.5	7.9	5.2	0.6	8.4	5.0
Oil		4.4	12.5		4.5	12.4		4.5	12.4		4.6	12.2
Intrm Gds	1.1	3.8	6.2	1.2	4.5	5.7	1.2	4.6	5.6	1.2	5.2	5.1
Cnsmr Drbls	2.0	4.6	11.7	3.5	6.2	10.8	3.8	6.4	10.7	5.4	8.1	10.1
Kapt Gds	1.9	6.3	6.5	2.3	7.1	5.9	2.3	7.3	5.8	2.7	8.1	5.3
Services	-0.2	0.2	-0.5	-0.2	0.4	-0.6	-0.2	0.5	-0.6	-0.1	0.8	-0.7

California

Sector	Scenario 1 Non-Ag Tarrif Removal			Scenario 2 Full Tariff Removal			Scenario 2a FR/VEG Phase In			Scenario 3 Mexican Liberalization		
	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex
Ag Prod	0.0	-1.8	0.9	0.3	25.8	2.5	0.4	25.5	2.7	0.7	59.5	-17.8
Frt & Veg	0.1	-1.2	1.0	0.2	13.7	20.1	0.2	5.3	10.4	0.5	16.6	16.2
Other Ag	-0.0	-0.9	0.7	0.1	7.6	2.4	0.1	7.5	2.5	0.3	9.1	0.3
Food Proc	-0.3	5.0	8.3	-0.2	4.4	9.8	-0.2	4.3	10.0	0.1	7.2	5.1
Light Mfg	0.1	5.8	6.9	0.2	5.3	7.7	0.2	5.2	7.8	0.3	4.9	8.4
Oil		12.4	4.5		12.4	4.5		12.4	4.5		12.2	4.6
Intrm Gds	0.2	4.4	3.7	0.3	4.0	4.4	0.3	4.0	4.5	0.3	3.7	5.0
Cnsmr Drbls	0.0	10.4	4.6	0.0	9.6	6.2	0.0	9.5	6.5	0.1	8.7	8.1
Kapt Gds	0.1	3.9	6.2	0.1	3.7	7.1	0.1	3.6	7.2	0.1	3.4	8.1
Services	0.0	-0.4	0.2	0.1	-0.5	0.4	0.1	-0.5	0.5	0.2	-0.6	0.8

Table 9: Sectoral Output and Trade Results of Alternative Sc

(Difference (%) From Base Run Values)

SET II: Protection

United States

Scenario 4
Protection

Sector	Output	Exp to Mex	Imp fr Mex
Corn	1.3	16.3	
Ag Prod	0.4	25.7	
Frt & Veg	0.2	-3.7	-6.7
Other Ag	0.1	-3.5	-2.5
Food Proc	0.2	-2.2	-6.2
Light Mfg	0.1	-1.3	-0.8
Oil		-2.7	-0.6
Intrm Gds	0.1	-1.8	-0.1
Cnsmr Drbls	0.1	-2.6	0.7
Kapt Gds	0.0	-1.8	-0.4
Services	0.1	0.1	0.3

Mexico

Scenario 4
Protection

Sector	Output	Exp to US	Imp fr US
Corn	-8.5		16.3
Ag Prod	-7.2		25.7
Frt & Veg	-4.7	-6.7	-3.7
Other Ag	-2.3	-2.5	-3.5
Food Proc	-2.8	-6.2	-2.2
Light Mfg	0.0	-0.8	-1.3
Oil		-0.6	-2.7
Intrm Gds	-0.3	-0.1	-1.8
Cnsmr Drbls	1.2	0.7	-2.6
Kapt Gds	-0.1	-0.4	-1.8
Services	0.2	0.3	0.1

California

Scenario 4
Protection

Sector	Output	Exp to Mex	Imp fr Mex
Ag Prod	0.3	25.6	-19.9
Frt & Veg	0.3	-3.7	-6.6
Other Ag	0.1	-3.5	-2.5
Food Proc	0.3	-2.1	-6.2
Light Mfg	0.0	-1.3	-0.8
Oil		-2.6	-0.6
Intrm Gds	0.0	-1.8	-0.1
Cnsmr Drbls	0.0	-2.7	0.7
Kapt Gds	-0.0	-1.9	-0.4
Services	0.1	0.1	0.3

Table 9: Sectoral Output and Trade Results of Alternative Scenerios

(Difference (%) From Base Run Values)

SET III: Liberalization & Growth

United States

Sector	Scenario 5 Pro-Competitive			Scenario 6 Mexican Growth			Scenario 7 Mexican BOT Deficit			Scenario 8 Mexican Growth & BOT Deficit		
	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex
Corn	6.6	138.2		10.6	219.0		11.7	266.5			333.5	
Ag Prod	0.5	47.4		1.4	127.3		0.9	170.9		1.3	222.8	
Frt & Veg	-0.0	19.0	13.2	-0.2	47.5	25.2	-0.4	68.6	-13.0	-0.8	107.1	-1.9
Other Ag	-0.1	13.4	-3.3	0.3	34.9	11.3	-0.7	49.5	-21.7	-0.4	79.3	-9.6
Food Proc	-0.0	9.4	-0.1	-0.1	32.6	26.7	-0.2	44.8	-31.3	-0.6	75.1	-9.9
Light Mfg	0.0	9.7	25.0	-0.0	27.7	22.6	-0.4	39.1	-20.5	-0.5	61.3	-5.4
Oil		14.1	3.4		29.4	-5.1		16.4	2.0		33.4	-7.2
Intrm Gds	0.2	5.2	10.3	0.3	19.7	14.4	-0.3	38.6	-19.9	-0.2	49.8	-9.3
Cnsmr Drbls	-0.1	8.0	17.9	-0.2	12.6	25.6	-0.2	56.4	-41.8	-0.6	53.3	-27.1
Kapt Gds	0.1	10.5	2.2	0.1	12.5	18.8	-0.1	35.9	-23.9	-0.1	39.7	-12.1
Services	-0.0	1.2	-1.1	-0.1	3.0	12.7	-0.5	10.0	-6.4	-0.8	12.4	6.0

Mexico

Sector	Scenario 5 Pro-Competitive			Scenario 6 Mexican Growth			Scenario 7 Mexican BOT Deficit			Scenario 8 Mexican Growth & BOT Deficit		
	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US	Output	Exp to US	Imp fr US
Corn	-11.6		138.2	-10.2		219.0	-14.7		266.5	-3.9		333.5
Ag Prod	-6.8		47.4	-2.6		127.3	-22.9		170.9	-11.9		222.8
Frt & Veg	1.1	13.2	19.0	19.1	25.2	47.5	-7.9	-13.0	68.6	9.8	-1.9	107.1
Other Ag	-0.5	-3.3	13.4	16.7	11.3	34.9	2.0	-21.7	49.5	20.9	-9.6	79.3
Food Proc	-1.0	-0.1	9.4	17.9	26.7	32.6	2.7	-31.3	44.8	23.9	-9.9	75.1
Light Mfg	11.0	25.0	9.7	18.8	22.6	27.7	0.3	-20.5	39.1	18.2	-5.4	61.3
Oil		3.4	14.1		-5.1	29.4		2.0	16.4		-7.2	33.4
Intrm Gds	3.8	10.3	5.2	12.3	14.4	19.7	1.3	-19.9	38.6	11.6	-9.3	49.8
Cnsmr Drbls	16.6	17.9	8.0	27.6	25.6	12.6	-36.7	-41.8	56.4	-22.7	-27.1	53.3
Kapt Gds	0.5	2.2	10.5	12.1	18.8	12.5	-8.4	-23.9	35.9	-0.3	-12.1	39.7
Services	0.0	-1.1	1.2	14.0	12.7	3.0	2.6	-6.4	10.0	16.7	6.0	12.4

California

Sector	Scenario 5 Pro-Competitive			Scenario 6 Mexican Growth			Scenario 7 Mexican BOT Deficit			Scenario 8 Mexican Growth & BOT Deficit		
	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex	Output	Exp to Mex	Imp fr Mex
Ag Prod	0.2	33.9	-3.0	0.7	65.9	-13.7	0.2	127.8	-45.4	0.3	127.1	-38.2
Frt & Veg	0.0	20.4	12.8	-0.2	15.6	24.3	-1.2	56.0	-13.1	-1.7	48.8	-2.4
Other Ag	-0.2	13.0	-3.6	-0.1	3.7	10.2	-1.4	37.5	-24.6	-1.5	26.2	-13.3
Food Proc	-0.3	9.1	-0.1	-1.5	1.2	26.7	-3.1	31.0	-31.1	-4.4	19.1	-9.6
Light Mfg	0.1	-3.0	24.8	0.2	0.2	22.5	0.5	31.4	-20.7	0.3	21.4	-5.6
Oil		13.7	3.5		25.2	-5.0		15.2	2.3		28.0	-6.8
Intrm Gds	0.3	1.2	10.0	0.3	0.7	13.9	-0.0	21.6	-20.0	-0.1	14.5	-9.6
Cnsmr Drbls	0.0	5.2	17.7	0.0	4.5	25.4	-0.1	45.9	-41.9	0.0	37.4	-27.3
Kapt Gds	0.1	4.9	2.1	0.3	2.0	18.6	0.1	10.4	-24.3	0.3	7.0	-12.7
Services	-0.0	1.2	-1.2	-0.0	-2.3	13.6	-0.4	8.7	-6.7	-0.6	5.4	6.5

Table 10: Changes in Wage Rates

(Difference (%) in Wage Rates From Base-Run Values)

	Experiment	Region	Rural Workers	Urban Unskilled	Skilled Workers	White Collar	Capital (Rental)
TYPE I Liberalization	1. Non-Ag Tariff Removal						
		U.S.	-0.24	-0.24	-0.01	-0.01	-0.01
		Mexico	0.70	0.70	0.09	0.07	0.08
		California	-0.24	-0.24	0.00	0.00	-0.01
	2. Full Tariff Removal						
		U.S.	-0.89	-0.89	0.03	0.03	0.03
		Mexico	0.76	0.76	0.39	0.36	0.42
		California	-0.90	-0.90	0.03	0.03	0.03
	2a. FR/VEG Phase In						
		U.S.	-0.96	-0.96	0.04	0.03	0.04
		Mexico	0.79	0.79	0.41	0.38	0.41
		California	-0.97	-0.97	0.04	0.03	0.03
	3. Mexican Liberalization						
		U.S.	-1.80	-1.80	0.12	0.11	0.12
		Mexico	-0.58	-0.58	-0.56	-0.62	-0.97
		California	-1.81	-1.81	0.10	0.09	0.09
TYPE II Protectionism	4. Protection						
		U.S.	-0.84	-0.84	0.09	0.08	0.09
		Mexico	-1.55	-1.55	-0.97	-0.99	-1.41
		California	-0.84	-0.84	0.07	0.06	0.07
TYPE III Liberalization & Growth	5. Pro-Competative Impact						
		U.S.	-0.08	-0.08	-0.08	-0.08	-0.08
		Mexico	-1.50	-1.50	0.37	0.22	5.32
		California	-0.08	-0.08	-0.04	-0.04	-0.05
	6. Mexican Growth						
		U.S.	0.10	0.10	-0.22	-0.22	-0.21
		Mexico	7.18	7.18	8.27	8.38	-1.51
		California	0.10	0.10	-0.15	-0.14	-0.18
	7. Mexican BOT Deficit						
		U.S.	3.69	3.69	-0.31	-0.29	-0.30
		Mexico	-13.51	-13.51	-2.72	-2.58	-2.54
		California	3.70	3.70	-0.26	-0.23	-0.28
	8. Mexican Growth & BOT Deficit						
		U.S.	3.28	3.28	-0.28	-0.27	-0.27
		Mexico	-11.74	-11.74	-2.57	-2.44	-2.42
		California	3.29	3.29	-0.24	-0.21	-0.26

Table 11: Change in Sectoral Labor Employment

SET I: Liberalization

Scenario 1: Non-Agriculture Tarrif Removal

	US	CA	MX
Rural Workers Agric Prod	-0.1	-0.0	6.0
Rural Workers Corn	-0.0	0.0	-4.6
Rural Workers Frt & Veg	-0.0	0.0	5.3
Rural Workers Other Ag	0.1	-0.0	-6.6
Urban Unskilled Consumer Durbls	0.2	0.0	0.4
Urban Unskilled Food Processing	0.0	-0.1	-0.1
Urban Unskilled Interm Gds	0.3	0.0	0.6
Urban Unskilled Kap Gds	0.1	0.0	0.4
Urban Unskilled Light Mfg	0.1	0.1	0.3
Urban Unskilled Oil	0.0	0.0	0.0
Urban Unskilled Services	-0.7	-0.1	-1.7
Skilled Workers Consumer Durbls	1.4	-0.0	3.2
Skilled Workers Food	-0.1	-0.5	-1.2
Skilled Workers Interm Gds	3.2	0.4	6.3
Skilled Workers Kap Gds	1.7	0.5	3.9
Skilled Workers Light Mfg	0.2	0.6	2.0
Skilled Workers Oil	-0.0	-0.0	-0.0
Skilled Workers Other Ag	0.0	-0.0	0.0
Skilled Workers Services	-6.4	-1.0	-16.1
White Collar Agric Prod	-0.1	-0.0	0.0
White Collar Consumer Durbls	0.4	-0.0	0.8
White Collar Food Processing	-0.0	-0.1	-0.3
White Collar Frt & Veg	-0.0	-0.0	0.0
White Collar Interm Gds	1.3	0.2	2.6
White Collar Kap Gds	1.5	0.5	4.0
White Collar Light Mfg	0.1	0.2	0.8
White Collar Oil	-0.0	-0.0	0.0
White Collar Other Ag	0.1	-0.0	0.0
White Collar Services	-3.2	-0.6	-9.7
Job Loss	**-10.6**	**-2.5**	**-39.3**
Job Gain	**10.6**	**2.5**	**39.3**

Scenario 2: Full Tariff Removal

	US	CA	MX
Rural Workers Agric Prod	-1.9	1.1	100.5
Rural Workers Corn	1.2	-7.0	-10.9
Rural Workers Frt & Veg	4.9	-0.6	6.5
Rural Workers Other Ag	3.2	-21.4	-21.1
Urban Unskilled Consumer Durbls	0.1	-0.1	0.6
Urban Unskilled Food Processing	0.0	0.0	0.0
Urban Unskilled Interm Gds	-13.2	28.8	0.8
Urban Unskilled Kap Gds	0.4	0.0	0.6
Urban Unskilled Light Mfg	0.2	-0.1	0.5
Urban Unskilled Oil	-3.3	7.3	0.4
Urban Unskilled Services	0.6	-3.0	-2.3
Skilled Workers Consumer Durbls	1.2	-1.6	4.9
Skilled Workers Food Processing	0.0	-0.1	-0.1
Skilled Workers Interm Gds	0.1	-1.0	117.2
Skilled Workers Kap Gds	3.2	-3.2	6.8
Skilled Workers Light Mfg	1.6	-2.2	2.2
Skilled Workers Oil	-1.4	3.2	0.2
Skilled Workers Other Ag	-2.8	1.4	0.0
Skilled Workers Services	1.3	0.0	-189.2
White Collar Agric Prod	-0.1	-0.1	0.0
White Collar Consumer Durbls	0.3	-0.2	0.9
White Collar Food Proc	0.0	0.0	0.0
White Collar Frt & Veg	-0.9	0.4	0.0
White Collar Interm Gds	1.0	0.0	2.7
White Collar Kap Gds	2.4	-1.1	5.6
White Collar Light Mfg	0.3	-0.2	1.3
White Collar Oil	0.2	-0.1	0.3
White Collar Other Ag	0.0	-0.0	0.0
White Collar Services	0.3	-0.1	-20.5
Job Loss	**-23.5**	**-42.1**	**-252.0**
Job Gain	**23.5**	**42.1**	**252.0**

Scenario 2a: FR/VEG Phase In

	US	CA	MX
Rural Workers Agric Prod	0.5	-0.1	-21.7
Rural Workers Corn	1.3	0.0	-181.0
Rural Workers Frt & Veg	0.1	-1.0	92.4
Rural Workers Other Ag	-1.9	1.1	110.2
Urban Unskilled Consumer Durbls	0.1	-0.1	0.7
Urban Unskilled Food Proc	-1.4	3.2	0.2
Urban Unskilled Interm Gds	0.4	0.0	0.6
Urban Unskilled Kap Gds	0.2	-0.1	0.5
Urban Unskilled Light Mfg	0.2	-0.1	0.3
Urban Unskilled Oil	0.0	0.0	0.0
Urban Unskilled Services	0.6	-3.0	-2.4
Skilled Workers Food Processing	-13.0	28.4	0.9
Skilled Workers Interm Gds	4.9	-0.6	6.5
Skilled Workers Kap Gds	3.1	-3.1	6.9
Skilled Workers Light Mfg	1.5	-2.2	2.2
Skilled Workers Oil	0.0	-0.1	-0.1
Skilled Workers Consumer Durbls	1.1	-1.6	5.3
Skilled Workers Other Ag	-0.9	0.4	0.0
Skilled Workers Services	3.2	-21.2	-21.7
White Collar Agric Prod	0.0	-0.0	0.0
White Collar Consumer Durbls	0.3	-0.2	1.3
White Collar Food Processing	-3.2	7.2	0.4
White Collar Frt & Veg	-0.1	-0.1	0.0
White Collar Interm Gds	1.9	0.0	2.7
White Collar Kap Gds	2.4	-1.1	5.7
White Collar Light Mfg	0.3	-0.2	1.0
White Collar Oil	0.0	0.0	0.0
White Collar Other Ag	-2.7	1.4	0.0
White Collar Services	1.1	-7.0	-11.2
Job Loss	**-23.1**	**-41.6**	**-238.0**
Job Gain	**23.1**	**41.6**	**238.0**

Scenario 3: Mexican Liberalization

	US	CA	MX
Rural Workers Agric Prod	1.2	-0.1	-97.9
Rural Workers Corn	1.4	0.0	-271.0
Rural Workers Frt & Veg	0.1	-1.2	159.5
Rural Workers Other Ag	-2.6	1.3	209.5
Urban Unskilled Consumer Durbls	0.1	-0.1	0.8
Urban Unskilled Food Processing	-1.7	3.8	-1.1
Urban Unskilled Interm Gds	0.4	0.0	0.6
Urban Unskilled Kap Gds	0.2	-0.1	0.6
Urban Unskilled Light Mfg	0.2	-0.1	0.3
Urban Unskilled Oil	0.0	0.0	0.0
Urban Unskilled Services	0.8	-3.6	-1.3
Skilled Workers Food Processing	-15.6	34.3	-10.3
Skilled Workers Interm Gds	5.3	-0.8	6.5
Skilled Workers Kap Gds	3.4	-3.8	7.7
Skilled Workers Light Mfg	1.8	-2.7	2.5
Skilled Workers Oil	0.0	-0.1	-0.1
Skilled Workers Other Ag	-1.1	0.5	0.0
Skilled Workers Services	5.2	-25.4	-13.2
Skilled Workers Consumer Durbls	1.0	-1.9	6.9
White Collar Agric Prod	0.5	-0.0	0.0
White Collar Consumer Durbls	0.2	-0.3	1.7
White Collar Food Processing	-3.9	8.7	-3.2
White Collar Frt & Veg	-0.1	-0.1	0.0
White Collar Interm Gds	2.0	-0.0	2.6
White Collar Kap Gds	2.5	-1.3	6.2
White Collar Light Mfg	0.4	-0.3	1.0
White Collar Oil	0.0	0.0	-0.0
White Collar Other Ag	-3.5	1.7	0.0
White Collar Services	1.9	-0.3	-9.2
Job Loss	**-28.5**	**-50.3**	**-406.3**
Job Gain	**28.5**	**50.3**	**406.3**

Table 11: Change in Sectoral Labor Employment

SET II: Protectionism

Scenario 4: Protection

	US	CA	MX
Rural Workers Agric Prod	3.0	0.1	-128.8
Rural Workers Corn	0.5	0.0	-190.8
Rural Workers Frt & Veg	0.8	1.2	-46.3
Rural Workers Other Ag	5.7	0.7	-43.0
Urban Unskilled Consumer Durbls	2.4	0.6	0.4
Urban Unskilled Food Processing	2.1	0.5	-1.0
Urban Unskilled Kap Gds	2.7	0.8	0.2
Urban Unskilled Interm Gds	4.8	3.8	0.3
Urban Unskilled Light Mfg	7.5	1.0	0.5
Urban Unskilled Oil	0.8	0.1	0.1
Urban Unskilled Services	292.9	38.6	41.2
Skilled Workers Consumer Durbls	0.4	-0.1	1.8
Skilled Workers Food Processing	1.4	0.7	-13.1
Skilled Workers Interm Gds	0.2	-0.1	-1.6
Skilled Workers Kap Gds	-0.1	-0.4	-0.3
Skilled Workers Light Mfg	2.3	-0.0	-0.0
Skilled Workers Oil	-0.1	-0.0	-0.0
Skilled Workers Other Ag	-0.1	0.0	0.0
Skilled Workers Services	-3.9	-0.1	13.3
White Collar Agric Prod	0.7	0.0	0.0
White Collar Consumer Durbls	0.1	-0.0	0.4
White Collar Food Processing	0.4	0.2	-4.3
White Collar Frt & Veg	0.0	0.2	0.0
White Collar Interm Gds	0.1	-0.0	-0.8
White Collar Kap Gds	-0.0	-0.3	-0.5
White Collar Light Mfg	0.6	-0.0	-0.2
White Collar Oil	0.6	-0.0	-0.2
White Collar Other Ag	-0.2	0.1	0.0
White Collar Services	-1.7	-0.1	5.3
Job Loss	**-6.1**	**-1.1**	**-430.7**
Job Gain	**330.0**	**48.4**	**63.5**

Table 11: Change in Sectoral Labor Employment

SET III: Liberalization & Growth

Scenario 5: Pro-Competitive Impact

	US	CA	MX
Rural Workers Agric Prod	1.1	-0.2	-47.8
Rural Workers Corn	1.5	0.0	-107.1
Rural Workers Frt & Veg	0.5	-1.7	84.6
Rural Workers Other Ag	-3.0	1.9	150.3
Urban Unskilled Consumer Durbls	-0.1	-0.2	-2.4
Urban Unskilled Food Processing	-2.4	5.9	0.2
Urban Unskilled Interm Gds	0.7	0.0	-0.8
Urban Unskilled Kap Gds	0.3	-0.1	0.3
Urban Unskilled Light Mfg	0.4	-0.2	-14.9
Urban Unskilled Oil	-0.0	0.0	0.2
Urban Unskilled Services	1.2	-5.5	36.4
Skilled Workers Consumer Durbls	-0.9	-2.9	-17.3
Skilled Workers Food Processing	-22.2	53.1	11.5
Skilled Workers Interm Gds	0.0	-1.3	-107.2
Skilled Workers Kap Gds	4.2	-6.0	11.5
Skilled Workers Light Mfg	4.1	-4.8	-133.8
Skilled Workers Oil	0.0	-0.1	3.5
Skilled Workers Other Ag	-1.8	0.7	0.8
Skilled Workers Services	7.7	-36.7	231.8
White Collar Agric Prod	-0.3	-0.1	0.0
White Collar Food Processing	-5.5	13.4	1.7
White Collar Frt & Veg	-0.0	0.0	0.0
White Collar Interm Gds	3.4	-8.0	-44.2
White Collar Kap Gds	3.3	-5.2	5.6
White Collar Light Mfg	1.0	-0.6	-51.0
White Collar Oil	0.0	0.0	0.6
White Collar Other Ag	-5.8	2.5	0.0
White Collar Services	4.3	-12.6	92.1
White Collars Consumer Durbls	-0.2	-0.4	-4.8
Job Loss	**-42.3**	**-77.5**	**-620.2**
Job Gain	**42.3**	**77.5**	**620.2**

Scenario 6: Mexican Growth

	US	CA	MX
Rural Workers Agric Prod	2.2	-0.1	-100.6
Rural Workers Corn	2.3	0.0	-243.5
Rural Workers Frt & Veg	-0.4	-1.4	142.7
Rural Workers Other Ag	-4.1	1.5	209.4
Urban Unskilled Consumer Durbls	-0.2	-0.1	2.1
Urban Unskilled Food Processing	-1.9	4.0	0.7
Urban Unskilled Interm Gds	1.1	0.0	-1.4
Urban Unskilled Kap Gds	0.3	-0.0	-0.5
Urban Unskilled Light Mfg	0.3	-0.1	1.4
Urban Unskilled Oil	0.0	0.0	-1.7
Urban Unskilled Services	0.4	-3.8	-0.6
Skilled Workers Consumer Durbls	-1.7	-2.0	17.9
Skilled Workers Food Processing	-17.5	35.6	6.3
Skilled Workers Interm Gds	12.5	-0.7	-16.7
Skilled Workers Kap Gds	5.0	-3.2	-6.7
Skilled Workers Light Mfg	2.5	-2.7	13.2
Skilled Workers Oil	0.1	-0.1	-14.0
Skilled Workers Other Ag	-0.7	0.6	0.0
Skilled Workers Services	-0.3	-27.5	-0.2
White Collar Agric Prod	2.3	-0.0	0.0
White Collar Consumer Durbls	-0.5	-0.3	4.5
White Collar Food Processing	-4.4	9.0	2.1
White Collar Frt & Veg	-0.2	-0.0	0.0
White Collar Interm Gds	4.7	0.0	-6.4
White Collar Kap Gds	3.7	-0.0	-5.2
White Collar Light Mfg	0.5	-0.3	5.0
White Collar Oil	0.0	0.0	-3.4
White Collar Other Ag	-2.2	2.0	0.0
White Collar Services	-4.0	-9.6	3.4
Job Loss	**-38.0**	**-52.7**	**-408.6**
Job Gain	**38.0**	**52.7**	**408.6**

Scenario 7: Mexican BOT Deficit

	US	CA	MX
Rural Workers Agric Prod	2.3	0.2	-271.9
Rural Workers Corn	2.8	0.0	-233.1
Rural Workers Frt & Veg	-0.8	0.8	54.3
Rural Workers Other Ag	-4.3	-1.0	450.6
Urban Unskilled Consumer Durbls	0.6	0.1	-7.3
Urban Unskilled Food Processing	1.3	-2.7	0.3
Urban Unskilled Interm Gds	-0.1	0.1	-0.2
Urban Unskilled Kap Gds	0.2	0.1	-2.2
Urban Unskilled Light Mfg	-0.0	0.5	-1.1
Urban Unskilled Oil	0.0	-0.0	-0.1
Urban Unskilled Services	-1.9	2.0	10.6
Skilled Workers Consumer Durbls	4.4	1.1	-61.0
Skilled Workers Food Processing	11.6	-24.2	6.1
Skilled Workers Interm Gds	-2.1	1.2	2.3
Skilled Workers Kap Gds	2.1	2.5	-28.9
Skilled Workers Light Mfg	-1.3	5.8	-6.3
Skilled Workers Oil	0.0	0.0	0.0
Skilled Workers Other Ag	0.3	-0.4	0.0
Skilled Workers Services	-15.1	14.0	88.5
White Collar Agric Prod	3.7	0.1	0.0
White Collar Consumer Durbls	1.1	0.2	-15.4
White Collar Food Processing	2.9	-6.1	1.3
White Collar Frt & Veg	-0.0	-0.1	0.0
White Collar Interm Gds	-0.7	0.3	-0.0
White Collar Kap Gds	1.8	1.1	-23.8
White Collar Light Mfg	-0.3	1.2	-3.1
White Collar Oil	0.0	-0.0	-0.1
White Collar Other Ag	1.1	-1.3	0.0
White Collar Services	-9.6	4.6	41.0
Job Loss	**-36.2**	**-35.7**	**-655.1**
Job Gain	**36.2**	**35.7**	**655.1**

Scenario 8: Mexican Growth & BOT Deficit

	US	CA	MX
Rural Workers Agric Prod	3.3	0.2	-265.7
Rural Workers Corn	3.9	0.0	-211.0
Rural Workers Frt & Veg	-1.4	0.7	65.1
Rural Workers Other Ag	-5.7	-0.9	411.6
Urban Unskilled Consumer Durbls	0.2	0.1	-6.5
Urban Unskilled Food Proc	1.3	-3.1	1.9
Urban Unskilled Interm Gds	0.7	0.1	-2.5
Urban Unskilled Kap Gds	0.3	0.2	-3.1
Urban Unskilled Light Mfg	0.1	0.5	0.1
Urban Unskilled Oil	0.0	-0.0	-1.8
Urban Unskilled Services	-2.6	2.2	11.9
Skilled Workers Consumer Durbls	1.2	1.5	-54.3
Skilled Workers Food Processing	11.4	-27.7	22.6
Skilled Workers Interm Gds	6.5	1.4	-23.9
Skilled Workers Kap Gds	3.5	4.0	-42.2
Skilled Workers Light Mfg	-0.6	5.9	5.6
Skilled Workers Oil	0.1	0.1	-15.8
Skilled Workers Other Ag	1.2	-0.3	0.0
Skilled Workers Services	-23.0	15.3	106.1
White Collar Agric Prod	5.9	0.2	0.0
White Collar Consumer Durbls	0.3	0.2	-13.5
White Collar Food Processing	2.8	-6.9	6.5
White Collar Frt & Veg	-0.1	-0.0	0.0
White Collar Interm Gds	2.5	0.4	-10.2
White Collar Kap Gds	2.7	2.0	-34.4
White Collar Light Mfg	-0.2	1.2	1.3
White Collar Oil	0.0	-0.0	-3.5
White Collar Other Ag	3.6	-1.1	0.0
White Collar Services	-17.5	4.2	53.8
Job Loss	**-51.2**	**-40.1**	**-686.3**
Job Gain	**51.2**	**40.1**	**686.4**