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LABOR MARKET PROJECTIONS FOR THE UNITED STATES AND MEXICO AND CURRENT MIGRATION CONTROVERSIES

The purpose of this article is to reassess the relations between the United States and Mexico by demonstrating current and future economic interdependence, particularly in the exchange of labor. The supply of labor in the United States is projected on the basis of current demographic data, and the demand for labor necessary to meet planned or projected levels of output in selected years is then calculated. The results of comparing the supply and demand for labor in the two countries are of course sensitive to the particular parameters used, especially considering the wide range of current predictions concerning sustainable rates of growth of output and productivity in both countries. In general, it appears that employment generation in post-petroleum Mexico may be just able to keep pace with its rapidly rising labor force. But only a sustained rate of growth of output in excess of 7 percent per annum will permit Mexico to soak up its large pool of unemployed and underemployed workers.

The United States is faced with the opposite problem. Regardless of the short run effect of the 1979-80 recession, an eventual shortfall of labor of some five million workers is likely by the year 2000, even given current levels of immigration and the maintenance of a substantial pool of undocumented aliens in this country. A curtailment of immigration combined with the Bureau of Labor Statistics low projection could result in aggregate shortfalls of 18 to 33 million workers within the period of this study. In short, even ignoring Mexico's oil reserves and the United States hunger for energy, it seems that the two countries share more than a border and are destined to move toward closer ties which may be mutually advantageous.

BACKGROUND

The major North American states—Mexico, Canada, and the United States—are drawing closer together through the exchange of labor, commodity trade, capital flows, and technology transfers even as their governments attempt to strengthen national autonomy and security in an increasingly multipolar world. The relative growth of Mexico and Canada in output and production has outstripped that of the United States in recent years. In 1960 Mexico and Canada had a combined gross national product one-tenth that of the United States. In

1976 their joint output was 14 percent of United States production, and by 2000 it is expected to total one-fourth. The combined population of Canada and Mexico amounted to 29 percent of the United States population in 1960 and 40 percent in 1976; by the year 2000 it will be 50 percent. These figures suggest that the North American region is likely to show an increasingly balanced distribution of output and population among its three major partners in the years to come.

However, it is by no means clear that the internal distribution of income will be more nearly equal in labor-abundant Mexico in the face of her burgeoning population and work force without a major effort at job creation and the "export" of a significant fraction of the labor force. In the United States the demographic imbalance caused by the "baby boom" is inspiring dire predictions of social upheavals, failure of the social security system, and other major structural changes early in the next century. Without substantial immigration, there will simply not be enough productive labor, given the declining rates of investment and productivity growth, to sustain the living levels of those outside the work force, not to mention those with redundant skills who remain "structurally unemployed." Hence both growth and distribution in the two countries will depend on their mutual interaction in all major economic dimensions. Notwithstanding the desire of each of the North American economies for maximum self-determination, they are destined to be bound together still further by strong complementarities in resource endowments, product mix, and demographic structure.

Trade in goods and services between the two countries is still highly asymmetrical, with about 67 percent of Mexico's exports directed to the United States markets, while only 4 percent of United States exports go to Mexico. However, the discovery of substantial new petroleum reserves will permit continued rapid growth of oil exports. Energy exports are already affecting both the level and balance of trade with the United States. The traditional current account surplus in favor of the United States is falling sharply and will almost certainly shift to a deficit during the next two decades, unless Mexican import restrictions are substantially liberalized. The current account balance will also be affected by trends in exogenous international capital flows. Mexico is already the second largest borrower of financial capital in the Third World (after Brazil). By the mid-1980s Mexico will have the option of using its expanded petroleum rents either to reduce debt exposure or to spur imports for domestic growth. Foreign direct investment could also increase significantly in the years ahead. Whatever the trend in net capital flows and implications for the trade balance, Mexico's share of United States imports is certain to rise, while the share of United States exports should increase as well in response to the rapid expansion of Mexican purchasing power.

The Mexican contribution to the United States work force comprises two major flows made up of those who immigrate permanently (legal and undocumented) and those who migrate temporarily. Mexican immigrants form a rotating pool of labor only part of which adds to the annual stock of workers as measured in decennial population censuses. In Table 1 estimates of these components are presented in terms of their evolution from 1940 to 1975. While the undocumented component is highly conjectural, the figures reflect the best availa-

ble estimates of the permanent and rotating components of the labor pool, reconciled with the census data from each country.

The two countries have become the most interdependent in the area of employment. Since 1940 an estimated two and one-half million Mexicans have joined the United States work force as permanent residents, while it may be conservatively estimated that at least one million more are in the labor pool each year as temporary migrants (Table 1). By 1975 at least three and one-half million workers from Mexico had joined the United States job market, not counting those born of Mexican parents. The pool is growing by about 170,000 per year, while the annual growth of the total United States work force is 1.7 million. Hence at least 10 percent of the growth in supply of American labor is represented by Mexican migrants. This number equaled 30 percent of net growth in the Mexican labor force by the mid-1970s, while the pool of Mexicans in the United States (accumulated since 1940) amounted to one-fifth of the economically active population of Mexico in 1975 (Table 1). Temporary migrant workers alone represented 5.8 percent of the Mexican labor force in that year. It is evident that Mexican workers play a relatively far greater role in the United States economy than does United States-Mexican trade, direct investment, or financial transactions.

TRENDS IN OUTPUT AND POPULATION GROWTH IN MEXICO AND THE UNITED STATES

Since 1950 the rate of growth of Mexican gross national product (GNP) has been almost double that of the United States. From 1950 to 1970 this was enough to more than compensate for Mexico's accelerating rate of population growth, so that even though United States per capita income grew, the gap between the two countries fell from 8.5 to 1 in 1950 to 6.8 to 1 in 1970 (Table 2). In the 1970s the picture began to change. Mexico's demographic explosion had begun to eat up most of the output growth, and by 1977 the income gap widened to 7.4 to 1. Slower growth and widening per capita income gaps between the United States and Mexico might well elicit a migratory response northward. Table 1 shows that Mexican migration substantially increased in the 1970s to make the present pool of Mexican labor in the United States by far the largest in history. However, Mexico's recent petroleum discoveries could generate the savings needed to accelerate the growth of production, while family-planning measures introduced by the government in the early 1970s should slow population growth. Government sources suggest a lowering of annual rates of population growth from 35 per thousand in the 1960s to 29 in the mid-1970s, with the downtrend expected to continue.¹

¹ Although it is clear that population growth rates have fallen, there is debate concerning the magnitude of the fall. In the United Nations-declared "Year of the Family" of 1973, a concerted effort was made to register all births in Mexico. Mexican vital statistics, which are kept by year of registration rather than by year of occurrence, were consequently biased upward in 1973 by inclusion of many births which would otherwise have gone unrecorded for a year or two. This led to a downward bias in the subsequent years which may have contributed to recent apparent declines in the birthrate.

TABLE 1.—MEXICAN CONTRIBUTIONS TO THE U.S. LABOR POOL FOR SELECTED YEARS*
(*Thousand workers*)

	1940	1950	1960	1970	1975
(1) Mexican labor force	5,858	8,345	10,213	12,955	15,400 est.
(2) Legal and undocumented temporary migrant workers (per year)	300	500	500	600	900
(3) Cumulative stock of permanent undocumented workers (beginning in 1940)	—	500	1,000	1,550	1,925
(4) Cumulative stock of legal immigrant workers (beginning in 1940)	—	30	210	470	650
(5) Total Mexican workers in U.S. labor pool ^a	300	1,030	1,710	2,620	3,475
(6) Mexicans working in U.S. as share of Mexican work force (5) ÷ (1) = (6)	5.1	12.3	16.7	20.2	22.6

*Mexican labor force totals for 1940, 1950, and 1970 are from the census data on economically active population age 12 and over (including unemployed). The 1960 census figure was adjusted to correct for overcounting 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). A detailed discussion of Mexican labor force and employment data is in Donald Keesing (1977), "Employment and Lack of Employment in Mexico, 1900-70," in J. W. Wilke and K. Ruddle, *Quantitative Latin American Studies*, UCLA Latin American Center, Los Angeles; his adjusted labor force total for 1950 is 8,272 and for 1960 is 9,691. For 1940 and 1970 they are the same as the census figures. The estimates in Row (2) are based on the number of legal temporary workers (including Braceros from 1942 to 1964) plus an estimate of undocumented workers during the previous five-year period (double the number of illegals deported reduced by one-fourth for non-participants in the work force). The figure is reduced by 20 percent more in 1975 to provide the most conservative possible estimate, in view of the speculative nature of the methodology used. Row (3) is based on the assumption that 10 percent of the seasonal migrants in Row (2) elect to remain in the United States each year. Row (4) represents the net cumulative legal migration of workers assuming that legal migrants from Mexico have a .65 labor force participation rate and a 5 percent attrition rate.

Figures on legal and undocumented migration and labor participation rates are from F. Ray Marshall (1978), "Economic Factors Influencing the International Migration of Workers," in S. R. Ross, editor, *Views Across the Border: The United States and Mexico*, University of New Mexico Press, Albuquerque; Domestic Council Committee on Illegal Aliens (1976), *Preliminary Report*, Washington, D.C.; and Wayne A. Cornelius (1978), "Mexican Migration to the United States (with Comparative Reference to Caribbean-Basin Migration): The State of Current Knowledge and Recommendations for Future Research," Working Paper No. 2, Center for U.S.-Mexican Studies, University of California, San Diego. The figures in the table represent estimated numbers of workers who will participate in the U.S. labor market at some time during the year cited, either as temporary or permanent additions to the stock of manpower and do not represent man-years of labor. Hence Row (2) includes workers who might have been employed in Mexico as well as in the U.S. during that year, since the average period of employment of temporary Mexican workers in the U.S. is from three to six months, Jorge Bustamante (1978), "National Survey on Outmigration in Mexico: Description and Preliminary Findings," paper presented at the Symposium on Structural Factors Contributing to Current Patterns of Migration in Mexico and the Caribbean Basin, El Colegio de Mexico, Mexico City; Jorge Bustamante and Roberto Chande (1979), "Análisis Estadístico de las Expulsiones de Indocumentados Mexicanos," El Colegio de Mexico, Mexico City; and Wayne A. Cornelius (1978).

"Mexicans" in the United States refers to all legal and illegal 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 detailed in a recent *Current Population Survey*. The magnitude of the difference (about one and one-half million people) can be explained as being all legal and illegal immigrants and their descendants who came before 1940. It is assumed, unrealistically perhaps, that most of the illegals are counted in this survey. Otherwise the gap would be greater.

TABLE 2.—TRENDS AND PROJECTIONS OF UNITED STATES AND MEXICAN
OUTPUT AND POPULATION, 1950 TO 2000*

Year	Gross national product (million 1977 dollars)		Population (millions)		GNP per capita (1977 dollars)		Ratio of GNP per capita
	U.S.	Mexico	U.S.	Mexico	U.S.	Mexico	
1950	756	15	152	26	4,984	586	8.5
1960	1,043	27	181	35	5,776	780	7.4
1970	1,522	54	205	49	7,430	1,095	6.8
1977	1,887	74	217	63	8,701	1,180	7.4
1985	2,399	120	235	79	10,209	1,519	6.7
1990	2,787	161	247	89	11,283	1,809	6.2
2000	3,762	294	273	109	13,780	2,697	5.1

*U.S. compound output growth rate for 1977 to 2000 at 3 percent per annum, Mexican output growth rate of 6 percent p.a.; U.S. population growth projected at 1 percent p.a. including migration 1977-2000 (see below); Mexican population growth assumed to decelerate, reflecting the second phase of the demographic transition from 2.8 percent p.a. 1977-85; to 2.5 percent p.a. 1985-90; and 2.0 percent p.a. 1990-2000. Note that the U.S. population projections above assume that there will be sufficient net immigration to permit a sustained 1 percent compound annual rate of growth. With no net immigration, the U.S. Bureau of the Census projects the following levels of U.S. population: (in thousands) 1985, 228,912; 1990, 237,028; 2000, 248,372 (this series reaches zero growth around the middle of the twenty-first century), U.S. Bureau of Census, *Current Population Reports*, series P-25, cited in U.S. Department of Commerce (1978), *Statistical Abstract of the U.S.*, Washington, D.C., pp. 8f. The U.S. population projections in the table imply a cumulative net immigration from 1978-85 of 6 million; from 1975 to 1990 of 10 million; and from 1978 to 2000 of 25 million, or 1.5 million people per year in the last decade of the century (more than twice the current flow).

Table 2 assumes that these factors of output growth and fertility decline must combine to reverse the disequilibrating trends of the early 1970s and permit Mexico again to outstrip the United States in rates of growth of per capita output. Mexico is hoping that GNP will grow at 7 to 7.5 percent annually between now and the end of the century. Assuming a 6 percent compound rate of growth of GNP and 2.8 percent population growth rate, one may project that the Mexico-United States per capita income gap would recover its 1970 ratio by 1985. That is partly because United States output is projected to grow at only 3 percent annually, though its population growth will remain at no more than 1 percent. Later in the paper it will be shown that there is no way short of a totally implausible productivity miracle that the United States will be able to sustain even a modest 3 percent rate of output growth assumed in Table 2 without substantial in-migration of labor. Even the most optimistic growth of Mexico's GNP at rates well beyond the 6 percent annually shown in Table 2 will be unable to absorb the tidal wave of demographic growth of earlier years between now and 2000. If there is no outlet for Mexico's impoverished workers, attempts to support them by make-work projects or income transfers will eat up scarce savings needed for investment. Associated social and political pressures will tend to discourage private investment. If contrasts between rich and poor across the border and over the fences of the *barrios* of Mexico are allowed to magnify, they could lead to domestic and international security problems that no rate of growth would resolve.

PROJECTIONS OF THE SUPPLY OF LABOR IN MEXICO

The labor supply in Mexico during the next 20 years depends upon three main factors: past demographic trends, desired participation rates of men and women of working age, and the expectations of gainful employment. Other factors which bring about changes in desired labor force participation of women are future fertility rate declines and the changing role of women in Mexico. It is not possible here to more than summarize some of the most salient findings of research on determinants of Mexican labor and piece them together into a framework consistent with the projections of output, population, and exchange between the United States and Mexico.

Estimates of Mexican labor force growth between 1970 and 2000, based on two alternative sets of estimates for those of working age (A and C) and alternative assumptions about labor force participation, are given in Table 3. These projections are relatively insensitive to assumptions about future demographic trends, since most of those who will be in the age group 15 to 64 between now and the end of the century have already been born. The economically active population is expected to double between 1980 and 2000. The number of job seekers will increase by 20 million, with a relatively rapid growth of women and with an overall 3.5 percent compound annual rate of growth of labor supply. Depending upon the overall demographic projection used, the gross labor participation rate will rise from 26 percent in 1970 to 30 percent (high population estimate) or 38 percent (low population estimate).

Even if education improves markedly in Mexico during the coming decades,

TABLE 3.—PROJECTIONS OF MEXICAN LABOR SUPPLY, 1970-2000*

Year	Total population estimate (millions)			Population, ages 15-64 (millions)			Economically active population (millions)		Labor participation rate (percent)			
									Active pop. ÷ pop. ages 15-64		Active pop. ÷ total population	
	A	B	C	A	B	C	A	C	A	C	A	C
1970		50			25.5		13.0		51.0		25.8	
1980 ^a	70	70	72	36.3		36.3	20.4	20.4	56.2	56.2	29.1	27.8
1985	79	81		42		42.6	24		57			
1990	89		100	50		52.2	29	28-30	58	54-58		28-30
2000	109	123	135	68	70.3	74.0	41	40	60	54	38	30

*Estimate A is based on the assumption of a rapidly declining population growth rate reaching 2.0 by 1990-2000 (see notes to Table 2). For the economically active population. Estimate A assumes a rising participation rate for the age group 15 to 64, based primarily on growing female participation and anticipating that Mexico will become more comparable to other developing countries. Its female labor force participation ratio is relatively low by international standards (Peter Gregory, 1976, "Employment and Unemployment in Developing Countries," World Bank, Washington, D.C.).

Estimate B is the low fertility projection III of Francisco Alba (1977), *La Población de México: Evolución y Dilemas*, El Colegio de México, Mexico City, which reduces fertility more gradually achieving a population growth rate of 2.03 for 1995-2000.

Estimate C is based on the projection of Victor Urquidí (1974), "Empleo y Explosión Demográfica," *Demografía y Economía*, Vol. VIII, No. 20, which is slightly higher than Alba's moderate fertility decline based on a population growth rate of 2.4 percent in 1995-2000 leading to a population of 135 million by the year 2000.

^aEstimated.

the majority of workers will have little more than a basic primary school education, and any improvement in educational skills or training will have to be through adult classes, on-the-job training, and home study (Urquidi, 1974). The labor supply will be heavily weighted by those qualified only for "unskilled" occupations at least into the 1990s. This will exacerbate whatever excess supply conditions are suggested by the aggregate projections, as structural employment problems will almost certainly worsen.

Lower demographic growth rates mean a possible increase in labor force participation by women, so that the slowdown population growth will have the paradoxical effect of increasing labor supply between 1980 and 2000. As a consequence the need to find means of absorbing that labor will increase rather than decrease as the demographic transition moves into its decelerating phase.

PROJECTIONS OF THE DEMAND FOR LABOR IN MEXICO

Will a doubling of the supply of labor in the next 20 years be matched by new jobs? In the past Mexico has had one of the lowest sustained rates of open unemployment in the developing world (Gregory, 1976; Keesing, 1977), despite very wide fluctuations in the level of economic activity and in demand for labor in the more productive high-wage occupations. Rather than becoming involuntarily unemployed in slack periods, Mexican workers have tended to voluntarily withdraw from the labor market, to find low-income self-employment in the informal sector, or to remain idle for large portions of the year. For example, between 1940 and 1950 female labor participation rates doubled as jobs became more plentiful, but then fell again between 1960 and 1970 as the labor market weakened (Keesing, 1977). In the 1960s the growth of self-employment in urban services was substantial, as modern sectors failed to provide enough jobs for migrants from agriculture (McFarland, 1973, as cited by Gregory, 1976). By the mid-1970s outmigration of labor appears to have accelerated in the face of a severe domestic recession.

Since the supply of labor in Mexico tends to shift with demand at the subsistence level, the labor slack shows itself less in terms of open unemployment than in a number of other indicators:

1. lagging or declining earnings of unskilled labor;
2. falling female participation rates;
3. increased seasonal unemployment and underemployment;
4. increased self-employment (especially in the urban informal sector);
5. slowed emigration from the rural to urban areas within Mexico; and
6. increased pressures for migration to the United States.

By the late 1960s the Mexican economy began to face serious obstacles to continued rapid growth in output, productivity, and employment. The "Mexican miracle" that had been heralded during the postwar period was running out of time. Its much vaunted agricultural productivity growth plummeted in the face of land and water constraints, even though demand for agricultural products continued to grow. The postwar "import-substituting" industries, which achieved important gains during previous decades, began to show the effects of

TABLE 4.—OUTPUT AND EMPLOYMENT GROWTH IN MEXICO, 1978-83, AND NET INVESTMENT REQUIREMENTS

130

CLARK W. REYNOLDS

	1977	1978	1979	1980	1981	1982	1983	Compounded annual rate of growth (percent) 1977-83
Gross domestic product (<i>billion 1977 dollars</i>)	74	79	84	91	98	105	110	6.61
Net investment (<i>billion 1977 dollars</i>)		8.7	10.4	11.9	13.4	15.1	15.5	
Employment (<i>thousand employees</i>)	17,057	17,687	18,316	19,012	19,730	20,522	21,241	3.66
Increase in employment (<i>thousand employees</i>)		630	629	696	718	792	719	
Incremental capital/ labor ratio (<i>net investment per additional job in 1977 dollars</i>)		13,800	16,500	17,000	18,700	19,100	21,500	
Capital/labor ratio (<i>capital per job in 1977 dollars</i>)		6,900	7,090	7,370	7,670	8,030	8,770	
Incremental capital/ output ratio (<i>net investment ÷ change in GDP</i>) (percent)		1.84	1.80	1.99	1.84	2.05	3.16	

*Data are from the DIEMEX/Wharton Mexican econometric model, Wharton Econometric Forecasting Associates (1979), "DIEMEX/Wharton: Mexican Econometric Model Pre-Meeting Solutions," Philadelphia, Pennsylvania, with values in billion 1960 pesos converted to 1977 U.S. dollars at a rate of one 1960 peso = \$181 U.S. dollar of 1977 purchasing power.

serving a limited domestic market behind quantitative and tariff barriers that permitted high prices and low quality relative to more vigorous export-oriented manufacturing industries abroad. By the early 1970s output growth had decelerated sharply, together with employment, even though capital formation continued to expand. Productivity growth had fallen to a fraction of its earlier levels. Hence by mid-decade the Mexican economy appeared to be in serious trouble and was no longer able to absorb more than a fraction of its rapidly increasing work force (Reynolds, 1979).

Some of the causes of the malaise were policy-induced, including an overvalued exchange rate that hurt exports and favored unproductive imports, increasing conflict between government and the private sector during the period from 1970 to 1976, the expectation of agrarian reform, new laws restricting foreign direct investment, and foreign borrowing by the Mexican government. A final jolting peso devaluation in 1976 created a major squeeze on corporate working capital and triggered a flight of short-term funds that drained foreign exchange reserves and stopped the economy cold (Reynolds, 1978; Tello, 1979; Villar, 1979). But harmful as these policy measures were, there were more important underlying problems associated with an increasingly inward-looking character of the economy that neglected the foreign market, serious inequalities in the distribution of income and wealth, increasing urbanization, and the spread of slums. The latter conditions created social unrest and political uncertainty that dampened expectations of potential domestic and foreign investors. The failure of potential leaders in the private sector to respond with courage and imagination to the immense problems of poverty and underemployment worsened the condition.

Given this background, Mexico's announcement of the discovery of major petroleum and natural gas reserves during the early days of the Lopez Portillo administration was greeted with understandable skepticism. However, as these announcements were gradually confirmed, expectations shifted from doubt to euphoria, and the predictions of Mexico's petroleum-led growth potential skyrocketed. A team from the World Bank provided a set of output forecasts assuming a sustained GNP rate of growth of 7 percent for Mexico through the year 2000 (World Bank, 1978, Table 40, p. 106). The Wharton moderate projection model suggests a more modest 6.6 percent rate of output growth for the period 1977 to 1983 (Table 4), and most of the projections in this paper assume a 6 percent rate of growth of gross domestic product through 2000 (Table 2). Sustained growth at 6 percent per annum implies a doubling of output every 12 years, and will require an enormous expansion in the capital stock, infrastructure, skilled labor, and managerial pool. This will in turn require a major expansion in imports of goods and skilled labor services making pressures for an opening of the Mexican economy to increased foreign trade and investment immense. While it will be difficult to turn outward the inward-looking orientation of Mexican planners, policy makers, and private entrepreneurs, the growth projections carry with them a relentless logic to do so.

Assuming that a 6 percent sustained growth rate may be achievable through the year 2000, what will be the consequences for Mexico's absorption of its work force and for wages of the lowest income groups? There are far more serious problems, and failure to find adequate answers will generate social pressures and

TABLE 5.—LONG TERM PROJECTIONS OF DEMAND FOR LABOR
IN MÉXICO, 1980 TO 2000^a
(*Million workers employed*)

	1980	1985	1990	2000 (1)	Projected labor force, 2000 (2)	Projected employment gap 2000 (3) = (2) - (1)
GNP growth rate of 4 percent compounded annually	19.0	21.2	23.7	29.5	40 - 41	10.5 - 11.5
GNP growth rate of 6 percent	19.0	22.4	26.4	36.7	40 - 41	3.3 - 4.3
GNP growth rate of 6.6 percent	19.0	22.9	27.5	39.8	40 - 41	0.2 - 1.2
GNP growth rate of 7 percent	19.0	23.1	28.1	41.5	40 - 41	-1.5 - -0.5

^a "Million workers employed is calculated based on an estimated output elasticity of labor demand of .554 (Table 4) from the DIEMEX/Wharton model applied to projected rates of output growth (Wharton Econometric Forecasting Associates, 1979, "DIEMEX/Wharton Mexican Econometric Model Pre-Meeting Solutions," Philadelphia, Pennsylvania). Such an elasticity is consistent with historical trends and with a projected pattern of petroleum-led growth, in which heavy industry and producer goods manufacturing figure prominently in development strategies. The projected labor force (supply of labor) for the year 2000 does not take into consideration present underutilization of employed labor (19.0 million active population in 1980) which amounts to 20 to 30 percent of the work force working only part of the year (approximately 2 to 3 million man-years of labor slack not including 1.3 million working in family enterprises without pay and 6 million self-employed, the majority of which are at the subsistence level) (Donald Keesing, 1977, "Employment and Lack of Employment in Mexico, 1900-70" in J.W. Wilkie and K. Ruddle, *Quantitative Latin American Studies*, UCLA Latin American Center, Los Angeles). An additional 3 to 4 million workers are employed at least part of the year in the United States. Moreover, there is a downward bias in the reported labor participation rate owing to slack in the labor market (see Peter Gregory, 1976, "Employment and Unemployment in Developing Countries," World Bank, Washington, D.C.; Donald Keesing, 1977; and this paper).

political conflict that could prevent realization of Mexico's new development dream.

A major difficulty in assessing the employment impact of alternative growth and investment strategies is the lack of hard information about the current structure of the demand and supply for labor and its likely change under alternative development strategies. The most recent input-output study of Mexico for the year 1970 (Mexico, SPP, 1979), an excellent tool of sectoral planning, will require a complementary matrix of labor inputs by skill and occupational category if it is used to project labor demand. Nor is there any manpower-planning framework which would permit linking Mexico's ambitious new industrial production plan (Mexico, SPFI, 1979) with projections of labor supply in order to determine the outlook for workers at all skill levels. This is needed to project additional education and training requirements in order to determine the immigration of skilled workers and managers that will be needed in the coming years. Not only are the employment implications of the industrial development plan unclear; the present administration has no agricultural development plan capable of providing rural employment projections nor does one appear to be forthcoming.

Given the shortage of reliable information relating output to employment and productivity in even the basic sectors of the Mexican economy and in view of the shaky nature of production forecasts, one cannot expect to generate very robust labor demand projections. As a second best approach a relatively crude employment forecast has been devised based on past trends in labor-output ratios and expected rates of productivity growth.

In Table 4 the *DIEMEX*/Wharton projections of output and employment through 1983 are used as reasonable indicators of growth. They rest on the following moderate assumptions about border openings for productive imports starting in 1980: achievement of readily realizable crude oil export targets rising from 375,000 barrels per day in 1977 to 1,105,000 barrels per day in 1983, and expected gas exports of 1 billion cubic feet per day beginning in 1980 rising to 2 billion cubic feet per day in 1983. The model's projections of petroleum export revenues need to be revised upward, however, given the recently announced price of \$22.60 per barrel for Mexican crude, as the model projects the price to reach only \$18.45 by 1983. The projected natural gas price in the model, \$2.81 per thousand cubic feet in 1980, rises to \$3.41 in 1983, and that figure is also subject to upward revision assuming that an export agreement will be reached with the United States. The model's exchange rate is semi-fixed, rather optimistically projecting the rate of inflation to decline from 32 percent in 1977 to 11 percent in 1983. This is unlikely given the liquidity-increasing effect of increased petroleum export revenues, government deficits, sustained foreign borrowing, and imported inflation.

The model projects output to grow at 6.6 percent annually through 1983, somewhat above the more conservative estimate of 6 percent for the period 1977-85 used in this paper (Table 2) and below World Bank projections of 8 percent per annum for the period 1980-82 (World Bank, 1978). The United States State Department shows even more optimism projecting a real rate of growth in Mexican GNP of 8 percent or more throughout the 1980s (U.S.

Foreign Service, 1979). Hence there may be some reason to expect Mexican employment growth to exceed the rate of 3.66 percent per annum projected in Table 4. The investment requirements for growth would rise accordingly, in terms of Mexico's present strategy which is to favor the creation of the third stage of import-substituting industry for the production of capital goods, even as it intends to reduce the effective protection of consumer and intermediate goods imports.

Table 4 indicates that additional jobs could be created with net investment of \$7,000 per job, based on past trends in factor utilization and a gradual rise in the capital-output ratio. The substantial difference between this figure and the marginal capital output ratio of \$16,500 stems from the nature of Mexico's development plans. Most new investment takes place in industries like petroleum and heavy manufacturing with high capital-labor ratios. The ratio of output to worker is higher in these industries, causing per capita output of the *employed* labor force to rise relative to other development strategy results, although alternate effects on per capita income are ambiguous.

It is conceivable that a major shift in the pattern of production and technology toward more labor-using and capital-saving activities would substantially raise the demand for labor per unit of output. This is by no means clear in fact. The government's present development plans focus on capital formation for growth of heavy industry, producer goods manufacturing, and the creation of infrastructure for the regional decentralization of industry, all of which are likely to increase rather than decrease capital-labor ratios.

There is evidence that a moderate growth in the petroleum and gas-based expansion of the economy will permit the demand for labor to just about keep up with growth in its supply. On the basis of estimates in Table 4, if output were to grow by 6.6 percent annually until 2000, employment would rise by the same amount as labor supply, or 20 million jobs (Table 3). However, all segments of the market would not be expected to grow proportionately, and it is almost certain that simply equating overall supply and demand would not correct structural imbalances, as low skilled workers would remain underemployed. Pay differentials would continue to widen between workers with different educational levels and access to high productivity employment. To raise real wages of the poorest workers given the current 20 to 30 percent rate of underutilization of Mexican manpower in 1975, another 4 to 6 million jobs would have to be created by the year 2000. With an employment elasticity of output of .55, this would require a sustained real rate of growth of GNP of 7 percent, between now and the year 2000, and the present pool of one to three million Mexicans working abroad would have to be maintained.

TIGHTNESS IN THE LABOR MARKET, RELATIVE WAGES, AND PRICES AND INCOME SHARES

General tightness or slackness in labor markets have the most dramatic effect on the earnings of low-skilled workers like those in agriculture and personal services. When markets are tight, workers in those sectors are attracted into higher wage industrial employment and into modern commerce and service activities. The employers of lower wage labor (for example, barbers, restaurant

owners, and farmers) are forced to offer higher wages as well. This may induce them to invest in productivity-increasing machinery, mechanized food operations, and mechanical harvesters. The price of the goods or services produced in these sectors will also rise giving the illusion of productivity growth. Thus in economies with tight labor markets, like that of the United States in 1979, the benefits from productivity growth in leading economic sectors spread to the mass of workers. But in economies with slack labor markets, workers in low-wage occupations are unable to participate significantly in rapid productivity growth because of the large number of potential competitors for their jobs. Where there are barriers to entry, such as unionization, the jobs themselves may be seen as "capital goods" with access to them bought and sold. In Mexico this is common for jobs that pay more than a pittance, and even union officials are involved in their sale. When industries raise wages beyond the going rate, long queues of workers form outside the gates waiting for a chance at the lottery.

It is necessary to distinguish between the fact of low wages in Mexico and the alleged "low productivity" of its labor. In fact, Mexican workers may perform precisely the same task as their North American counterparts, with equal or greater skill, yet receive one-eighth to one-tenth of the U.S. wage for the same job (Reynolds, 1979; Keesing, 1977). Barbers in Mexico earn 50 cents for a haircut that would cost \$5.00 north of the border. Cooks, waiters, and maids may receive \$60 a month for their services in Mexico, while they could earn \$600 in the United States. The price of their final product tends to be lower as well, so that such labor-intensive goods and services in Mexico cost a fraction of their United States price, *relative* to the cost of manufactured goods whose prices are set by international market conditions (plus import protection). It is not surprising that the labor share of national income in Mexico is a fraction of that of the United States share (50-60 percent rather than 80 percent), while the return to land, capital, and other assets is more than double the United States figure (40-50 percent rather than 20 percent). Moreover, skilled workers, managers, and university-educated people in Mexico earn wages that are a multiple of 10-20 times the wages of unskilled labor, while in the United States the multiple is much lower.

Where major gaps in real wages for the same skills and occupations exist across a relatively open frontier, and where the products are not easily tradable (most services and construction must be consumed on the spot), market forces induce migration. Migrant labor flows tend to raise the relative wages of unskilled workers in the slack labor market (Mexico) and lower them in the tight labor market (United States), if they cause changes in the total labor supply. The *relative* price of goods and services affected by changing wage costs would also tend to rise in Mexico and fall in the United States. Figures on recent patterns of migration (Table 1) indicate that Mexican migration to the United States has had a far more than marginal impact on the market for unskilled labor in both countries. Hence, *relative* wage and price effects must have almost certainly resulted from these migratory flows, though in the United States they may have merely slowed the growth of real wages in low-skilled occupations. The word "relative" is underscored here because if both output and productivity are growing rapidly in the receiving country, it is possible for the wages of unskilled

labor to rise, though they would rise more rapidly in a protected job market. In fact, real wages in the United States have stagnated or declined in recent years for most workers, except those in industries whose unions are particularly strong, like auto manufacturing, teamsters, construction workers, doctors, and employees, like corporate executives, with more direct access to the profit pool. After-tax earnings of working class households have declined in real terms during the past decade. This has been associated with a decline in the rate of growth of output and productivity of labor, low rates of investment, and lagging research and development. Labor tightness (insufficient migration in low-skill areas) may have adversely affected wages and productivity growth by constraining the ability of American industry to hold its own in increasingly competitive international markets. However, in the absence of growth, migration has probably held down relative wages of unskilled labor.

The findings of an earlier section indicate that if Mexico's output growth can be maintained at 6.6 percent annually until the year 2000, the demand for labor will just keep pace with supply. A 7 percent sustained growth rate for the same 20-year period would begin to absorb Mexico's severe underemployed and would almost certainly raise real incomes of the majority of Mexico's poor. The relative price of agricultural products, domestic services, and labor-intensive commodities would rise accordingly, forcing a change in the life-style of Mexico's elite. However, growth rates of 6 to 7 percent imply a tripling or quadrupling of output between now and 2000 and an even more rapid growth in imports of capital and intermediate goods, managerial know-how, and skilled labor. Rapid growth is essential to relieve dependence on migration, but will require increased dependence on foreign markets for trade, investment, and skilled labor. Since more effective labor absorption with rising real wages is a *sine qua non* for social and political stability, and stability is needed to elicit investments for further growth, improved links with the United States commodity, labor, and capital markets are essential to whatever priority is chosen—growth, employment, or distribution.

PROJECTIONS OF THE SUPPLY AND DEMAND FOR LABOR IN THE U.S. ECONOMY, 1985-2000

Several rough projections of aggregate labor supply and demand through the year 2000 are presented below (Table 6). Estimates of the rate of growth of the labor supply are adapted from Bureau of Labor Statistics projections published in the *Monthly Labor Review* (U.S. Department of Labor, 1978). Since almost the entire labor force of the year 2000 has already been born, the primary variables in predicting the labor force are the participation ratio, the unemployment rate, and the amount of net immigration over this period.

Participation ratios have been rising at increasing rates over the past few years, primarily due to rapidly increasing labor-market participation among women. The decrease of the "push effect" of falling birthrates and a lessening of the "pull effect" of a tight labor market will most likely combine to cause participation rates to increase at decreasing rates until 2000. The participation rates implicit in the labor-supply projections are also given below.

Immigration is assumed constant at 400,000 per year, which is slightly above current figures. Unemployment is assumed to fall to 4.5 percent in 1990 and remain there. The tables below give estimates of the labor supply net of this "structural and frictional unemployment."

On the labor-demand side two theoretical constructs were employed to arrive at total employment demand projections: For the first run, output-labor ratios were used in combination with a 3 percent annual rate of growth of aggregate output and a modest rate of growth of labor productivity based on an annual increase in the output-labor ratio of 1 percent. This productivity estimate is slightly below the historical trend figure of 1.3 percent growth from all sources. Using the formula $L^d(t) = Y^d(t) / OL(t)$, where $Y^d(t)$ is desired output (3 percent growth) in year t , OL is output-labor ratio in year t , and $L^d(t)$ is labor necessary to produce the desired level of output. (See Table 7.)

Although the exact magnitude of the impending labor shortages implied by Table 6 should not be relied upon, it is clear that shortfalls will occur if the United States pursues a goal of 3 percent per annum growth of GNP or greater without major increases in migration.

For the second run, a Cobb-Douglas production function is used: $Y_t^d = A_t \cdot L_t^{0.7} K_t^{0.3}$, where Y_t^d is desired output; $A(t)$ is a constant in any given year, but is a function of technological change (labor augmenting, capital augmenting, and jointly augmenting) over time; L_t is the labor force at time t ; and K_t is the contemporaneous capital stock. A simple algebraic transformation gives labor demand as a residual: $L_t = [Y_t^d / (A_t \cdot K_t^{0.3})]^{1.428}$ and the results are compared to labor supply projections in Table 6. (See Table 8.)

A_t , the measure of productivity gains from all sources, is assumed to continue the 1.38 percent growth rate it displayed in the period 1960-77. If the period 1970-77 is used as the base period to compute productivity growth, the resulting 1.04 percent estimate would substantially increase labor demand (L_t) in all periods.

The labor demand figures generated in this fashion run slightly below the Bureau of Labor Statistics (BLS) high projected labor force, but are well above either of the other predictions. As a sidelight, it is interesting to note that even the BLS predicts a shortage of labor, as they offset their unrealistically high predictions of labor force growth with even more optimistic output growth goals (3.65 percent).

As a summary, Table 9 shows the extent of shortfalls or surpluses, given alternate assumptions concerning the supply of and demand for labor. Only by combining the most optimistic estimates concerning the rates of growth of the labor force and productivity with lower GNP growth estimates than those made by government agencies can a sufficient supply of labor be predicted through the end of this century without increasing immigration.

In addition to the aggregate shortfall detailed above, there is a clear indication that the unskilled and semiskilled job categories will bear the brunt of the shortages. The United States labor force is becoming better educated and more experienced. Blacks and older immigrants who were previously counted on to do distasteful but necessary work in our modern economy are moving up the socioeconomic scale, leaving new immigrants (legal and illegal), students, and

TABLE 6.—EFFECTIVE UNITED STATES LABOR SUPPLY BASED ON LABOR FORCE PARTICIPATION IN 1990,
EXTENDED USING THREE ASSUMPTIONS* ^{a,b}
(Millions of workers)

	1985	1990	2000	Participation ratios ^c			Participation ratios (16-64 age group)		
				1985	1990	2000	1985	1990	2000
Labor supply I (high)	113.8	122.0	134.8	67.7	69.7	72.1	75.7	78.6	81.1
Labor supply II (medium)	110.0	116.1	126.8	65.3	66.2	67.2	73.2	74.8	75.7
Labor supply III (low)	106.1	110.5	119.5	63.0	63.0	63.3	70.6	71.2	71.3

*Data for 1990 are from U.S. Department of Labor (1978), Bureau of Labor Statistics, *Monthly Labor Review*, Washington, D.C.

^a Assumes immigration of 400,000 per year, military of 2.1 million (constant).

^b It is customary to speak of excess demand for labor apart from a normal level of employment. Even the most ardent Humphrey-Hawkins Act supporters recognize that frictional unemployment exists due to search time involved in changing jobs. It is not optimal on the individual or economy wide level for people to remain at one job for their entire economically active life. Invariably a certain percentage of the work force is between jobs. Structural unemployment is another unhappy fact of life. The skills required for a particular job may not match those of the individual looking for work. It may be prohibitively costly to relocate oneself to where the job is available, and transmission of information concerning job openings is neither perfect nor costless. Although a constant 4.5 percent rate of frictional unemployment is assumed, there is evidence that this rate is growing over time and may already be too low. Current estimates run from 4 percent (Humphrey-Hawkins Act), to Democratic Secretary of Labor Ray Marshall's 4.75 percent estimate as expressed in the Employment and Training Report of the President, to Milton Friedman's 6 to 7 percent estimate. Clearly an underestimate of this "normal rate" would lead to an underestimate of the total labor force necessary to provide any given level of employment and thus understate the potential labor shortages.

^c Follows Bureau of Labor Statistics convention of ratio of civilian non-institutional labor force over civilian non-institutional population 16 and over.

some women at the low end of the occupational scale (Piore, 1978). For students this is likely to be their first experience in the job market, perhaps on a part-time or temporary basis, and as the percentage of the population in this category declines in the next few years, so should their share in low-skill employment. Tomorrow's women will have increased access to education and training opportunities and accordingly will be better able to compete for jobs in the higher skill occupations.

It seems that without a substantial increase in immigration, traditional domestic sources of supply will not provide the necessary volume of unskilled labor to meet even a moderate target rate of growth for United States GNP. Employers faced with this shortage may react in various ways. Industries may move abroad at an increasing rate in search of a steady supply of labor, a response which has already begun to take place. Mechanization of jobs previously done by hand, such as the picking of certain crops, is a second alternative, as is upgrading pay and working conditions to draw higher skilled workers into lower skilled jobs.

Harold Wool projects the supply of labor for "lower level" jobs through the 1980s under assumed conditions of full employment (1976).² He demonstrates that while the civilian labor force is projected to grow at a yearly rate of 1.75 percent in the period 1970-85, the supply of labor for lower level jobs will increase by only 0.64 percent per year, with almost all of this increase concentrated in the 1970-80 period. "Comparisons of these labor supply projections with recent Bureau of Labor Statistics projections of employment or labor demand by occupation under a full employment model in turn result in potential surpluses of workers for high-level occupations and potential shortages for lower level occupations" (Wool, 1976). Unfortunately, Wool does not make clear the extent to which immigration, both legal and illegal, enters into his calculations.

Leonard Lecht made projections of a similar nature (1968). Analysis of his work in retrospect illustrates some of the problems in projecting current trends any

TABLE 7.—UNITED STATES LABOR DEMAND AND SUPPLY PROJECTIONS
TO THE YEAR 2000

Year	OL (output- worker) (1977 dollars)	Y (GNP) (billions of, 1977 dollars)	Labor demand (A) (millions of workers)	Labor supply I (from Table 6)
1970	18,606	1,522	81.80	81.8
1977	20,380	1,887	92.60	92.6
1985	22,070	2,399	108.70	113.8
1990	23,190	2,787	120.16	122.0
2000	25,621	3,762	146.83	134.8

² He defines lower-level jobs as those with the smallest percentage of the most "competitive" workers, defined as whites with 12 or more years of education between the ages of 25 and 34.

TABLE 8.—U.S. LABOR DEMAND AND SUPPLY PROJECTIONS
TO THE YEAR 2000

Year	Labor demand (B) L_t	Labor supply I	Labor supply II	Labor supply III	Desired GNP (Y_t^d)	Capital Stock (K_t)
	<i>(millions of workers)</i>				<i>(billions of 1977 dollars)</i>	
1970	81.80	81.8	81.8	81.8	1,522	5,069.35
1977	92.60	92.6	92.6	92.6	1,887	6,091.78
1985	103.97	113.8	110.0	106.1	2,399	7,268.84
1990	112.14	122.0	116.1	110.5	2,787	7,992.47
2000	131.81	134.8	126.8	119.5	3,862	9,441.14

significant distance into the future. He assumed 4.5 percent per annum growth of GNP, 3.5 percent yearly growth of labor productivity, and a constant unemployment rate of 3.9 percent. As a result he overestimated 1975 GNP by about one-sixth. Yet his estimate of the 1975 labor supply is surprisingly close to the actual number, since the overestimate of GNP growth is offset for the most part by the overestimate of the growth of productivity. Table 10 compares his projections to the actual numbers.

Nevertheless, there is compelling evidence that the aging demographic structure of the United States will lead to an increasing shortfall of labor to fill low-skilled jobs. The demand for migrants to fill the gap may be as high as 15 to 30 million workers by the year 2000, if United States GNP is to continue to grow at past rates of 3 percent or better, unless one of two circumstances occurs: either there will have to be a massive increase in participation rates, or much accelerated growth of investment and productivity coupled with a much higher rate of savings than in recent decades. In short the United States has an almost certain need for migrant labor in the decades ahead if it is to maintain its position in the international economy. The migrants need not come from the south, but given the likelihood of a sustained surplus of unskilled labor in Mexico despite its highest growth projections, most of the migrants will be Mexican.

SUMMARY AND CONCLUSIONS

Despite limited information about current labor-market structure and rather speculative projections about government policy and private expectations affecting future investment and growth in Mexico and the United States, the following propositions seem reasonably secure:

- 1.) Mexico's supply of labor will grow at 3.6 percent annually and reach a total of 40 million workers by the end of the century. (Underemployment is now 4 to 6 million.)
- 2.) Mexico's GNP is likely to grow at about 6 percent annually over the same 20-year period, provided that the economy has access to substantial inputs of skilled labor, technology, capital and intermediate goods, and some consumer goods.
- 3.) A 6 percent rate of GNP growth will suffice to keep pace with increases in the labor force including a modest increase in participation rates and will not begin to absorb the 4 to 6 million workers plus more than 3 million Mexican workers presently employed full or part-time in the United States.
- 4.) For Mexico to begin to mop up its underemployment, enabling it to raise real wages of less skilled workers significantly, GNP would have to grow at a sustained rate of over 7 percent annually until the year 2000, a goal almost unprecedented among developing nations. Such an achievement would place an even greater dependence on foreign trade, capital, technology, entrepreneurship, and skilled labor, much of which would have to come from direct foreign investment. While such investment might well be in close association with Mexican capital and entrepreneurship, its role in the economy would be critical. The United States would almost certainly have to figure prominently in the process.

TABLE 9.—ALTERNATE ASSUMPTIONS CONCERNING THE
SUPPLY OF AND DEMAND FOR LABOR^{a,b}
(Millions of workers)

Labor force projection, model and year	Labor Force I	Labor Force II	Labor Force III
Output labor model: demand (A) ^c			
1985	+5.10	+1.30	-2.60
1990	+1.84	-4.06	-9.66
2000	-11.03	-20.03	-27.33
Cobb-Douglas model: demand (B) ^d			
1985	+9.83	+6.03	+2.13
1990	+9.86	+3.96	-1.64
2000	+3.99	-5.01	-12.31

^a(-) indicates shortfall (excess demand for workers) and (+) indicates labor surplus.

^bBy the year 2000, population figures include 8.5 million immigrants, 6 million in the labor force at year 2000 participation rates, thus the maximum anticipated shortfalls are 33.3 to 18.3 million, with zero net immigration over this period. If the existing pool of approximately 2 million illegal aliens in the work force is also deported, the shortfall could be as high as 35.3 million by the year 2000.

^cAssuming 1 percent annual rate of growth of labor productivity (output per worker).

^dAssuming 1.38 percent annual rate of growth of factor productivity.

TABLE 10.—ACTUAL AND PROJECTED EMPLOYMENT FOR 1975 BY LECHT*

	Lecht	Actual	Difference (percent)
Total labor force (<i>million</i>)	93.6	94.8	-1.30
Employed labor force (<i>million</i>)	89.8	87.0	3.22
GNP (<i>billion dollars</i>)	1,967	1,687	16.60

*Data are from Leonard Lecht (1968), *Manpower Requirements for National Objectives in the 1970s*, U.S. Department of Labor, Washington, D.C.

5.) Even if total labor demand should grow at the same pace as supply, structural problems are certain to become serious, leading to shortages in more skilled occupations and surpluses in less skilled ones. The faster the rate of output growth, the greater the structural imbalances, and hence the greater the need to link labor markets between the United States and Mexico to balance supply and demand for skills.

6.) The level of income of the mass of Mexican workers, and their income shares, are likely to be influenced most by the tightness or slackness of the labor market. There are presently about 4.0 million Mexicans working in the United States during some part of the year, and the number is growing at about 170,000 per year. (See Table 1.) Such a flow will have to be sustained if Mexico is to achieve a significant tightening of its labor market, even at the most optimistic GNP

growth projections, in view of the current high level of underemployment. If Mexico is successful in raising real wages toward United States levels, there are likely to be increased entrants from Central America into the Mexican work force especially in the southern regions.

It would be incorrect to give the impression that there is a labor pool in Mexico which can supply 20 million workers to the United States in the next 20 years, or that such a massive influx of people of another cultural heritage would not give rise to social problems and conflicts. The traditional pool from which migrants flow both to America and metropolitan areas within Mexico is a declining fraction of the total population, and as the marginal product of labor in this sector rises as a result of outmigration, the relative incentive to leave declines. In short, there is no endless queue of Mexicans clamoring to enter the United States, as it seems some policy makers fear. Although on the basis of the imprecise figures it would not be unheard of to have a million Mexican immigrants entering the United States in one year, this pace has historically never lasted for five years, much less 20, and problems of assimilating so many newcomers are too numerous and complex to be covered here.

7.) The demand for labor in the United States, based on rather modest growth projections for GNP of 3 percent per annum, will almost certainly outstrip supply in the next 20 years, placing enormous pressures on the labor market to encourage increasing levels of immigration. The political-economic conditions associated with the proximity of the two countries, plus the likelihood of surplus unskilled labor in Mexico in the years ahead, will make continued and growing migration from that country a *sine qua non* of mutual growth with social and political stability.

8.) United States direct investment in Mexico may have a significant impact on employment of low-skilled labor. While its traditional direct investments have been relatively capital intensive and may not be expected to produce more than 25,000 to 50,000 jobs per year assuming an investment rate of 500 million to 1 billion dollars per year (Appendix 2), the establishment of a much larger number of in-bond³ assembly plants (*maquiladoras*) throughout Mexico could generate up to one million additional jobs by 1985. With a rapid growth of output of 6 to 7 percent annually, the combined total of as much as 1.25 million new jobs between 1980 and 1985 would represent 28 percent of the estimated 4.4 million growth in the labor force during the same period. Such investment plus immigration of Mexican labor into the United States labor market at just above current rates could go far to reverse the trend in surplus labor in Mexico and begin to increase the real incomes of Mexico's poor.

9.) Perhaps more important, if Mexico's economy were permitted to develop on a broad front—including light, medium, and heavy industry—and if its agriculture were stimulated as well in labor-using directions, it could provide new growth centers in North America to serve a continent-wide market. Such a balanced transformation of Mexico, linked with access to United States markets, technology, and financial capital, could also help the United States to achieve its

³ In-bond industries are assembly plants for foreign businesses exempt from tariffs on their imported intermediate goods and which produce solely for export.

own growth objectives. Labor, capital, and technology would be permitted to follow lines of dynamic comparative advantage on a region-wide basis. Of course this implies a rather significant restructuring of United States industry away from more traditional lines of production in which certain economic and social costs will be incurred. In Appendix 1 Mexican trade with the United States is projected through the year 2000 if current trends continue even without a major shift in trade policy by either country.

10.) The framework of this analysis has stressed the interdependence of output, employment, and income distribution both in the Mexican and United States economies and between them. A consistency framework for trade and balance-of-payments projections appears in Appendixes 2 and 3. The magnitude of Mexico's prospective economic and population growth underscores the fact that changes south of the border will have far more than incremental consequences for the United States. Stresses and strains within Mexico, if they occur, would shake the continent, but success in Mexican development would be likely to carry with it major benefits for her continental neighbors. To maximize the mutual benefits from Mexico's economic and demographic growth, it may well be necessary for the United States to engage in a fundamental reassessment of its own national economic goals. Such a reassessment is long overdue, in the face of chronic inflation, balance-of-trade deficits, slowed output and productivity growth, and one of the lowest rates of savings and investment in the world. It may well be that in the future the United States will need Mexico as much or more than Mexico will need the United States, even without considering important complementarities in the energy area.

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PREFACE TO APPENDIXES 1 TO 3

Recent developments in Mexico have put United States-Mexican economic relations at a crossroads. The discovery of huge petroleum reserves may profoundly change trade relations between the two countries. Removal of Mexico's foreign exchange constraint through sales of petroleum will allow Mexico to take a more independent stance in regard to its northern neighbor. At the same time the United States will find it difficult to reduce its share of imports from Mexico because of its need for petroleum and natural gas as well as American industry's use of Mexican labor in production sharing, not only in the in-bond industries but, as shown above, throughout the United States economy. If the United States does not actively seek to improve relations with Mexico now, especially in regard to her vast labor surplus, Mexico may choose to reduce its dependence on imports from the United States over the next two decades. The trade balance could then turn decidedly in Mexico's favor, aggravating the United States balance-of-payments problem. The United States will have to adjust to becoming more

dependent upon Mexican imports than vice versa. In Appendix 1 possible trends in United States-Mexican trade are discussed on the basis of alternative assumptions about the degree of interconnection.

The United States share of total direct foreign investment in Mexico has also been slipping in recent years. Although the direct impact of such investment in terms of jobs or additions to total GNP is not very large, foreign investment tends to occur in the most dynamic sectors and fosters domestic imitation which can be potentially important to the pattern of economic change in Mexico. Trade discussions are likely to be linked with measures to expand United States direct investment in ways suitable to Mexico's desire for maximum control over its process of economic growth, yet which will elicit important responses from United States firms. The United States might well consider offering Mexico a new set of trade and investment policies which would at least maintain the present share of United States involvement in the Mexican economy. (This is an underlying assumption in Appendix 2.) Failure to do so would result in the erosion of the United States market position in Mexico's rapidly evolving economy. The United States must recognize, in the light of the facts and figures presented in this paper, that good trade and investment relations with Mexico will be far more important to the United States economy through the year 2000 than will its interactions with the Chinese. The political and security implications of economic relations between the two countries will also far exceed the importance of those with China. Appendixes 2 and 3 discuss direct foreign investment and the Mexican balance of payments in this perspective.

APPENDIX 1.—SOME MEXICAN TRADE PROJECTIONS WITH IMPLICATIONS FOR UNITED STATES EXPORTS AND IMPORTS

The United States share of Mexican imports in 1977 was 63.6 percent. It was higher in the 1950s and 1960s, but during the 1970s the United States share remained close to 63 percent. Canada is the major trading partner of the United States, but Mexico is the most important trading partner among the developing countries and ranks fifth overall. In manufactures alone, Mexico is the third largest importer of United States production, even ahead of Japan. Given the growth potential described elsewhere in this paper, Mexico will soon become the fourth largest trading partner of the United States and the second largest importer of United States manufactures as its trade with the United States surpasses that of the United Kingdom.

Presently, Mexico has a low trade ratio (exports and imports divided by gross domestic product). In 1977 it was .21, lower than all South American countries and Canada with the exception of Brazil (.15) and Argentina (.17). Among the major oil-exporting nations the lowest trade ratio is Indonesia's which was .4 in 1977. (Trade data are from International Monetary Fund, 1979.) The World Bank projects an increase in the Mexican trade ratio to .265 by 1982 associated with an 8 percent rate of growth of gross national product (GNP) in the early 1980s. Whether or not the ratio moves that fast, there will have to be an increase if Mexico intends to shift from import substitution to export promotion. This shift will be essential for rapid growth in output and productivity. The petroleum industry will provide another major push. Before long, if Mexico wishes to gain

increased access to the major industrial markets, it will probably elect to join General Agreement on Trades and Tariffs (GATT) and to continue to lower many import barriers.

If Mexican GNP grows at about 6 percent per year until the year 2000, and its trade ratio increases to .35, Mexican imports will grow at 10 percent per year, from 6 billion current dollars in 1977 to more than 52 billion 1977 dollars in the year 2000.

Exports will grow at a slightly lower rate under the 6 percent growth assumption which is consistent with the World Bank forecast that its current account will remain in deficit. The United States share of Mexican exports is likely to increase, assuming eventual agreement on natural gas sales, increased sales of petroleum products, and further establishment of in-bond¹ industries throughout Mexico. The balance of trade between Mexico and the United States on current account, traditionally in favor of the United States, has been steadily decreasing and may soon shift to a Mexican trade surplus.

Because of the political realities of petroleum and natural gas consumption in the United States, Mexico will find itself with substantial bargaining power in future trade negotiations and may well choose to link sales of natural gas and petroleum to the establishment of additional in-bond industry and improved access to the United States market for cash crop exports on a much broader basis than simply winter vegetables and fruits. Mexico's major exports in 1977 by order of importance were crude petroleum, coffee, cotton, tomatoes, assorted machinery, and shrimp. Mexico will be attempting to enter the international market in producer goods and consumer durables in the next 20 years. This will depend on foreign markets and on United States direct investment to provide managerial ability, technical information, and specific links to the United States domestic market. For these reasons, although the United States bargaining position with Mexico has eroded, it has not disappeared. It will become apparent to both sides that continued and improved access to the United States domestic market may help to accelerate and diversify Mexican trade so as to minimize dependence on petroleum. Failure by the United States to capitalize on its location and historical advantage in trade with Mexico will almost certainly result in a negative balance of trade with Mexico and slow growth of its own economy.

In 1976 and 1977 Mexico was able to reduce its total imports in spite of poor harvests and increased government imports of grains. This reduction in imports was largely borne by the private sector and was associated with a slowdown of the rate of growth of gross domestic product (GDP) to 1.7 percent in 1976 and 3.2 percent in 1977. Bottlenecks in production caused by austerity measures essential during the difficult transition from high to more moderate rates of inflation were a major cause of the slowdown, but these bottlenecks were removed in 1978 as the current account was allowed to return to its petroleum-deficit position (Villar, 1979). In 1978 President Lopez Portillo called for 16.5 billion dollars worth of new investment in the state-owned petroleum corporation, Pemex, by 1982 and 1 billion dollars worth of new investment per year in electrical power generation to permit a 10 percent annual growth in electricity output. Most of the capital

¹ In-bond industries are assembly plants for foreign businesses exempt from tariffs on their imported intermediate goods which produce solely for export.

TABLE A1.1—UNITED STATES SHARE OF MEXICAN TRADE: TWO ALTERNATIVE PROJECTIONS
(Millions of 1977 dollars)

Year	Total exports	Exports to the U.S.	Assumed U.S. share (percent)	Total imports	Imports from the U.S.	Assumed U.S. share (percent)
Projection 1: U.S.-Mexican trade-linked projection ^b						
1980	8,400	5,900	70	11,400/11,800	7,500/7,800	66
1985	14,600	10,800	74	15,400/16,800	10,800/11,800	70
1990	22,000/23,000 ^c	16,500/17,200	75	23,000/26,000	16,800/19,000	73
2000	50,500/57,200	37,900/42,900	75	52,400/63,200	39,300/47,400	75
Projection 2: Independent Mexican trade policy projection ^d						
1980	8,400	5,900	70	11,400/11,800	7,300/7,600	64
1985	14,600	10,100	69	15,400/16,800	9,200/10,100	60
1990	22,000/23,000	14,300/15,000	65	23,000/26,000	13,100/14,800	57
2000	50,500/57,200	32,800/37,200	65	52,400/63,200	26,200/31,600	50

^aThe trade ratio is assumed to rise to .225 in 1980, .25 in 1985, .28 in 1990, and .35 in the year 2000. Imports are projected to exceed exports by the average of the two estimates for the current account deficit taken from either the 6 percent or 7 percent growth projections in the Mexican balance of payments tabulation in Appendix 2.

^bProjection 1 assumes a rising share of U.S.-Mexican trade in total Mexican exports and imports.

^cThe figure on the left side of the slash assumes a growth rate of the Mexican economy of 6 percent per year. The one on the right assumes a growth rate of 7 percent per year.

^dProjection 2 assumes a declining share of U.S.-Mexican trade in total Mexican exports and imports.

goods needed for expansion of electrical power and about half of those for petroleum investment must be supplied from abroad (United States Department of Commerce, 1978-79).

Mexico still imports few consumer goods. According to the United States Department of Commerce, in the near future Mexico will need heavy industry equipment, construction machinery, tractors and other heavy agricultural equipment, locomotives, railway rolling stock, iron and steel items (automotive and machine parts, pipe, sheet metal, et cetera) and scrap, chemicals, and a wide variety of raw and semi-processed materials. The current account deficit is likely to remain high at least until 1982 as the current presidential term comes to an end, partly to speed growth and partly because Mexican public sector deficits have historically risen as a share of GNP (World Bank, 1978).

The growth of trade largely depends on the willingness of the Mexican government to accelerate its petroleum production. In the past, realized investment in the petroleum sector has tended to lag behind government forecasts. Estimates of an 8-9 percent annual growth of GDP starting in 1980 depend on petroleum production growing much more rapidly than is consistent with current Mexican government plans though there is already evidence that output will be stepped up over targets announced in 1979. Real growth of the Mexican economy is more likely to hold at around 6 to 7 percent per year even under the most favorable conditions. Attempts at faster growth will run up against a shortage of skilled labor and managerial capacity and will produce severe inflationary pressures. A slower growth of petroleum exports implies a slower growth of the trade ratio which will probably not exceed .25 by 1985.

Table A1.1 provides estimates of Mexican trade with the United States to 2000, assuming growth of the Mexican economy at both 6 percent and 7 percent per year.

APPENDIX 2.

UNITED STATES DIRECT INVESTMENT IN MEXICO

At the end of 1976 total United States direct foreign investment was about 3 billion. Of this amount 2.2 billion was in manufacturing, mostly chemicals, transportation equipment, primary and fabricated metals, food processing, non-electrical machinery, and electrical and electronic machinery and apparatus. Most investment was in import-substituting industries with high capital requirements so that except for in-bond clothing and electronic industries, employment generation per unit of capital was lower than for the Mexican manufacturing sector as a whole.

The United States has traditionally accounted for more than 70 percent of total direct foreign investment in Mexico. The following tabulation lists the total United States direct foreign investment in Mexico valued at the end of the year in millions of dollars:

1963	1965	1967	1969	1970	1971	1972	1973	1974	1975	1976	1977
907	1,177	1,343	1,631	1,786	1,838	2,025	2,379	2,854	3,177	2,984	3,175

TABLE A3.1.—MEXICAN BALANCE OF PAYMENTS: SELECTED YEARS FROM 1962-78 AND
ALTERNATIVE PROJECTIONS TO THE YEAR 2000 FOR THE CURRENT AND LONG-TERM CAPITAL ACCOUNTS*
(Millions of dollars)

Year	Balance of goods and services	Long-term capital	External credit	Direct foreign investment	Other	Errors and omissions	Short-term capital	Variation in Bank of Mexico reserves
1962	- 120.2	224.7	147.5	90.3	- 13.1	- 87.6		16.9
1968	- 632.2	379.0	136.6	116.8	125.6	302.2	—"	49.0
1970	- 924.0	503.9	324.2	200.7	- 21.0	523.2 ^b	—"	102.1
1972	- 789.4	790.4	557.8	214.9	17.7	263.7 ^b	—"	264.7
1973	- 1,175.4	1,676.1	1,370.7	286.9	18.5	- 378.4	—"	122.3
1974	- 2,558.1	2,730.8	1,999.2	362.2	369.4	- 135.8	—"	36.9
1975	- 3,768.9	4,339.9	3,477.5	362.3	500.1	- 406.0	—"	165.1
1976	- 3,068.6	4,650.9	4,464.4	299.1	- 112.6	- 2,454.2	551.0	- 320.9
1977 ^c	- 1,550.3	4,380.3	4,149.9	327.3	- 96.9	- 458.7	- 1,867.1	504.2
1978 ^c	- 2,462.5	4,330.6	4,076.8	293.6	- 39.8	81.6	- 1,727.1	222.5
Projection ^d								
1980	- 3,000	3,000	2,400	600				
1985	- 660/- 840 ^e	660/840	—	660/840				
1990	- 890/- 1,130	890/1,130	—	890/1,130				
2000	- 1,620/- 2,060	1,620/2,060		1,620/2,060				
Alternative Projection ^d								
1980	- 3,600	3,600	3,000	600				
1985	- 2,260/- 2,440 ^e	2,260/2,440	1,450/1,320	810/1,120				
1990	- 2,890/- 3,130	2,890/3,130	1,750/1,550	1,140/1,580				
2000	- 5,720/- 6,160	5,720/6,160	3,480/3,060	2,240/3,100				

*Sources: Banco de Mexico (1973-79), *Indicadores Economicos*, various issues.

^aUntil 1976 short-term capital was included in errors in omissions.

^bErrors and omissions in 1970 and 1972 include the values for special drawing rights.

^cThe figures for 1977 and 1978 are preliminary estimates.

^dBoth projections are in 1977 dollars.

^eThe left of the slash represents an estimate of direct foreign investment of .55 percent of gross domestic product and the right side represents an estimate of direct foreign investment of .8 percent of GDP.

In 1973 under the Echeverría administration, laws were passed which were intended to limit foreign participation in Mexican industry. However, even before the new laws were enacted, foreign participation in total private fixed investment had declined from 5 percent in the 1960s to 4 percent in the early 1970s. The downward trend continued and foreign participation in private fixed investment fell to 3 percent by 1977.

The Law for the Promotion of Mexican Investment and the Regulation of Foreign Investment limited foreign ownership in equity in new business to 49 percent. In some industries foreign ownership was limited to 40 percent or forbidden altogether.

Two laws having to do with patents, trademarks, and inventions shortened the period of patent protection to 10 years. Trademarks had to be Mexicanized and under certain conditions could be expropriated by the government. For some products, including some chemicals and pharmaceuticals, patent protection is not available. In 1977 a decree was issued which allowed the Mexican government to set a foreign currency budget for any foreign business in order to improve Mexico's balance of payments.

These laws, together with recession and devaluation of the peso, resulted in a decline in new direct foreign investment (DFI) from a high of 678 million (U.S. dollars) in 1974 to an estimated low of 530 million in 1978. Recent estimates by the Banco de Mexico indicate that 1979 investment may be considerably above values in recent years.

World Bank projections of new DFI are .95 percent of GDP, a much higher share than historical rates. In the 1960s new DFI was as high as .65 percent of GDP. In the 1970s values have ranged from .44 percent to .60 percent of GDP.

Increased foreign investment will be welcomed by Mexico if it serves to generate substantial increases in employment and if investors are willing to locate away from the major urban centers. Under Lopez Portillo many import-licensing restrictions have been removed and new foreign industry, with 51 percent of the equity owned by a Mexican silent partner, may qualify for low-cost loans or grants if the establishment of the business meets the needs of the surrounding community. By and large foreign business receives the same treatment as domestic business. Expectations of lowered inflation and reduced government borrowing (external debt limit of 3 billion dollars in 1978) over the next five years should encourage foreign investment. Because of past investment patterns and the location advantage of sharing a common border, the United States should continue to dominate foreign investment in Mexico.

Especially important to Mexico are the in-bond industries. In 1974 almost 25 percent of Mexican exports to the United States was value added generated through production sharing. Mexico allows complete foreign ownership of in-bond industries and frees them from patent limitations. No duty is charged by either the United States or Mexico on the components that move to Mexico and back across the border. Customs duties are charged only on the value-added component.

In 1971 Mexico was fifth among all countries in terms of value added as a processing platform for the United States. In 1977 Mexico was third, after West Germany and Japan, in spite of having temporarily priced itself out of the

processing market at the end of 1974 due to an overvalued peso and a rise in the minimum wage in the in-bond industries which drove labor costs above those in Japan for comparable work. Richard Bolin estimated that 250,000 jobs may have been created directly and indirectly with an investment per job ratio of only \$700 (1977).

Bolin believes, on the basis of past growth of the in-bond industry, that as many as 300,000 jobs may exist in this sector by 1983 with another 600,000 jobs generated indirectly.¹ In-bond industry requires little Mexican investment besides needed infrastructure, creates more employment than a comparable level of investment in other industries, and provides foreign exchange earnings. For these reasons, trade discussions with Mexico should definitely be linked with further United States investment in Mexican production-sharing industry.

Each of the 300,000 direct jobs is estimated to produce \$5,000 value added per year. The 600,000 indirect jobs are estimated to produce half as much. Total addition to GNP due to the in-bond industry in 1983 is estimated at 3 billion dollars (Bolin, 1977). The figures on increased jobs per dollar of investment, both direct and indirect, cited above seem to be somewhat exaggerated. However, the amount of additional in-bond investment may well exceed the Bolin projections (through 1983) by the mid-1980s if the United States and Mexico can agree to additional incentives for such industries and given the likelihood that United States firms will elect to shift some Asian production toward Mexico and to significantly expand their value-added links to Mexican markets. For this reason a total increase of direct and indirect employment in such industries may be projected of one million jobs by the mid-1980s, plus up to 50,000 jobs per year in other United States direct investment in Mexico, totaling 1.25 million new jobs by 1985 if a major new effort can be established between the United States and Mexico in these areas.

APPENDIX 3.—PAST VALUE AND PROJECTIONS OF THE MEXICAN BALANCE OF PAYMENTS THROUGH THE YEAR 2000: DISCUSSION AND TABLE

The first projection in the tabulation of Appendix 2 assumes a growth rate of GDP of 6 percent per year until 2000, generated without external borrowing and with moderate levels of DFI. Present goals of 16.5 billion dollars worth of new investment in the government-owned Pemex will probably result in a continued current account (trade balance of goods and services) deficit and continued external borrowing until 1985. From 1985 on it is assumed that the government will keep the balance of payments in equilibrium and allow the current account deficit to roughly equal the inflow of new DFI.

New DFI in the 1960s ranged from about .60 percent to .65 percent of GDP. In the 1970s through 1977 values fluctuated more widely from a high of .60 percent in 1970 to a low of .45 in 1975 and 1977 (preliminary estimate, Banco de Mexico, 1979). In the 6 percent growth projection new DFI is assumed to be as low as .55 percent of GDP or as high as .70 percent of GDP. The latter figure is higher than has been seen in the last two decades, but is lower than recent figures

¹Private communication, 1979.

for Venezuela (.76 percent of GDP in 1977) and Brazil (1 percent of GDP in 1977, International Monetary Fund, 1979).

World Bank projections assume that the balance on current account will remain in deficit in the foreseeable future. It is imperative that Mexico avoid allowing the peso to become overvalued relative to the dollar in terms of rates of inflation in the two countries and the relative cost of tradables. In 1974 due to overvaluation of the peso and a rise in the Mexican minimum wage along the United States border, Mexican wages in terms of dollars rose higher than comparable wages in Japan (Bolin, 1977). The inflated wage bill diverted investment toward Asia and cost Mexico thousands of jobs. Now that Mexico has a major source of export earnings in petroleum there should be no reason to attempt to lower the cost of producer goods imports through currency overvaluation. Allowing the current account deficit to offset long-term capital flows will help to maintain the peso and Mexican wages and exports at a competitive level.

The second projection is based on a growth rate of GDP of 65 percent until 1980 and of 7 percent from 1980 to 2000. The World Bank's long-range projection was also 7 percent (1978). Growth of the labor force as projected by Wharton at 3.6 percent per year through 1983 would require a growth rate of about 6.6 percent simply to maintain present employment levels (1979). Long term growth above 7 percent is probably not possible given the present skill levels and managerial capacity in the Mexican economy. The capital requirement for increasing the growth rate by a percentage point from the earlier projection will mostly be generated by internal savings which were 22 percent of new GDP from 1970-77 and are estimated to continue at that level, and by external borrowing. Capital is related to GDP through an assumed capital/output ratio of 2.1 which corresponds with Wharton's figures for 1978-83 (Wharton, 1979).

New DFI will contribute somewhat less in bringing about the increased growth rate. In this projection new DFI is estimated to be .65 percent of GDP at a minimum and .90 percent of GDP at a maximum. The latter value is an ambitious projection, almost as high as present levels in Brazil where there are fewer barriers to DFI. Brazil presently has the highest rate of new DFI as a percent of GDP (1 percent) of any major country in the western hemisphere and one of the highest in the world. A leap of new DFI in Mexico to .90 percent of GDP implies that there will be a new attitude toward DFI in Mexico on the part of the Mexican government and foreign investors.

External borrowing in the 7 percent growth projection model is quite small. It is predicted on the premise that private and public investment are complementary in Mexico, and that the Mexican government will not resort to foreign borrowing to meet public consumption goals. This was not always so in the past, but may be possible by 1985 with increased installed capacity in the petroleum sector generating additional government revenues.

Total external debt is estimated to be about 35 billion dollars in 1985 in the 6 percent growth projection model and about 40 billion dollars in 1985 in the 7 percent growth projection model. The former figure, given an expected increase

of exports as a percent of GDP to about 11 percent by 1985, implies a debt service ratio (debt service/exports) of less than .40; the latter figure of less than .42. The debt service ratio for 1977 was .48. The World Bank has estimated a fall in the debt-service ratio to .39 by 1982 based on projections of a substantial increase in the export to GDP ratio and rapid growth of the economy in the early 1980s (1978). In any case the falling debt-service ratio from a peak of .48 in 1977 is likely to improve Mexico's profile in the eyes of the international financial community.

