A New View Of Financial Flows From Labor Migration: A Social Accounting Matrix Perspective

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Most of the recent academic interest in international migration by economists was created by the increasing labor flows of the 1970s and 1980s, and most research has been concerned primarily with the effects on receiving countries. But emigration and the financial flows associated with it can also have severe economic and social implications for the sending countries (Asch and Reichmann:1994). Russell and Teitelbaum (1992) estimate official global flows from labor-receiving countries to labor-sending countries to be US$ 71.1 billion in 1990, while the UN Population Fund (1996) estimates that there are 125 million people who are living in a country different from the one they were born in.

Much of the available economic analysis of international migration is at a micro economic level, based on sample survey data with a focus on the individual migrant worker and the migrant household.[1] There is also a rich literature on rural-urban migration starting with Lewis (1954), Ranis and Fei (1961), Todaro (1969) and Todaro and Marusko (1989), who later applied this framework to the context of international migration. These writings mostly ignored the financial flows (remittances) associated with it. Another strand of research in international migration dealt with the so-called brain-drain phenomenon.

Most of the writings which analyze the impact of migration and remittances on development have reached somewhat pessimistic conclusions. This pessimism is largely based on an analysis of the direct uses of remittances, which is regarded as the most important benefit of migration. There is abundant evidence from these studies that only a very small percentage out of total expenditures from remittances is spent on productive activities, and

hence it is concluded that there is a minimal developmental effect for the labor-sending country. The results also show that even when remittances have been directed to productive activities, they have failed to provide significant employment. But an analysis of the immediate uses of remittance income ignores the potential stimulus to indigenous industries, which in turn generates a multiplier effect on aggregate demand, employment and capital investment in excess of the original expenditure.[2]

The purpose of this article is to shift the focus of attention to the labor-sending country and to analyze the effects of these financial flows for the economy as a whole, in particular for the Mexican economy, which is one of the largest exporters of labor. Several studies have been done in Mexico, but they have been concerned with local and regional development, using case studies and non-representative data to make inferences at the national level. Furthermore, these financial flows have an impact beyond the local economy, because spending often is directed towards commercial towns some distance from the recipients' communities. Therefore, we need a broader base from which to draw conclusions at the national level. The use of an economy wide model such as a Social Accounting Matrix (SAM) should shed some light on the impact of these flows on macroeconomic variables and help us to understand more fully the contribution of migration to the economic growth of the labor-exporting country.

International Migration from Mexico to the United States

Until recently, the only source of Mexican data at the national level on undocumented migration was the ENEFNEU Survey (*Encuesta Nacional de Migración a la Frontera Norte y a los Estados Unidos*) carried out by the Centro Nacional de Información y Estadísticas del Trabajo.[3] The main objective of this survey was to obtain an accurate estimate of Mexican workers in the United States and their socio-economic characteristics.

The *Encuesta sobre Migración en la Frontera Norte de México* (EMIF) is an important recent attempt to gather data at the national level to shed some light on the complexities of Mexico-U.S. migration. This recent survey in Mexico is divided into four distinct populations conforming the flow of migrants between Mexico and the United States. One group is composed of those migrants who were apprehended at the border during their trip to the United States and consequently were deported back to Mexico. A second group is composed of those migrants who came to the border cities from other regions of Mexico but intend to seek work in the Mexican northern border cities such as Tijuana. The third group is composed of the flow of migrant workers who came to the border cities from other regions of Mexico

to seek work in the United States. The last group is composed of those migrant workers who were in the United States prior to the survey and are returning to Mexico during the survey period.[4]

For this study we shall examine the third and last groups of migrant workers, who can be properly counted as part of the flow of international migration between Mexico and the United States. The first group (deportees) in the survey may not be a representative sample of the entire flow and the second group of migrants (those heading only to the border towns) is considered to be part of Mexico's internal migration flow. Although internal migration may be equally important in terms of the number of migrants, our concern here is with international remittances which outweigh internal remittances in terms of value by a 10 to 1 ratio. Therefore, we will look at two groups, one composed of migrants from Mexico to the United States and the other composed of migrants returning to Mexico from the United States.

The Flow of Migrants from Mexico to the United States

The EMIF survey indicates that, between March 1993 and March 1994, the flow of emigrants arriving at the border towns from the rest of Mexico with the intention to cross into the United States to seek work totaled approximately 792,000 migrant workers (Corona and Tuirán: 1996). The same flow corresponding to the second phase of the survey (December 1994 to December 1995) is approximately 543,000 migrant workers.[5] I shall refer to this population as emigrants or circular migrant workers, because the EMIF survey provides evidence in support of the thesis that Mexico-U.S. migration is a circular process. This is a unique feature of migration between these two countries, due partly to their geographical proximity. Mexican migrants make several trips of different time lengths during their lifetime, continually alternating their stay and work in the United States but keeping their main residence in Mexico. The circularity of Mexican-U.S. migration is captured in the EMIF survey by the two flows under study, the flow to the United States and the flow back to Mexico. It should be noted that this is only part of the total flow of migrants, since the total flow from the south to the north also includes an additional group of migrants totaling around 865,000 migrant workers during the period March 1993-March 1994. This latter group arrived at the northern border with the intention of seeking work in the border towns. These migrants were not counted in the total flow of Mexico-U.S. migration, although it is possible that some of them might cross into the United States in the period after the survey was taken. Although not included in this study, this group is a significant part of Mexico's labor force when one considers

that they represent one third of the border states' total population and almost two-thirds of the economically active population in the northern border cities.

The flow of circular migrant laborers heading to the United States is mostly made up of males (94.4 percent) between the ages of 25 and 34 (37.3 percent) with fewer years of schooling than the national average for Mexico. As a group, they are less educated, with an average of 6.01 years of schooling, while the national average is 7.52 years for those between 15 and 44 years of age. The majority of these migrants are married (57.9 percent) and are the head of the household (65.1 percent). The migrant's characteristics found in this survey seem to support the findings of earlier studies characterizing Mexican migration. The results from the second phase of the survey are also consistent with the previous results from the first phase.

An important characteristic of the flow of migrants heading to the U.S. is the geographical distribution in the country of origin as illustrated in Table 1. As can be seen from Table 1 below, the top eight labor sending states have been losing some share of the total flow of migrants since 1977, but they still account for over two-thirds of it. The traditional sending states in the northwestern part of Mexico such as Zacatecas, Durango, and Jalisco seem to have lost representation in these flows as new states such as Nuevo León, Coahuila and especially the Distrito Federal are incorporated into the migration flow. The northern border states account for 25.1 percent of the flow of migrants to the U.S., followed by the states geographically situated between these northern border states and the northwestern region, i.e. Sinaloa, Durango, Nayarit, Colima and Aguascalientes. Four states, Guanajuato, Jalisco, Michoacán and Zacatecas have been consistently among the top sending states in terms of their contribution of migrants to the total flow from the 1920s until today.

It can be seen that in recent years more states are becoming part of the sending regions as the process of international migration reaches its one-hundredth year. It can be said that the process of migration is being diffused within Mexico as more states become part of the core of sending regions.

There is also a new pattern of emigration away from the large predominance of the rural areas. The EMIF survey shows that 56 percent of emigrants now come from urban areas while 42.1 percent come from non-urban areas,[6] perhaps reflecting the economic crisis that has affected Mexican urban areas in the 1980s. A case in point is Mexico's Distrito Federal, which although it is a late participant in the emigration process, now occupies third place among the most important sending places in recent years. This pattern is reinforced by the Cañón Zapata survey (1987-96) that points out that there is a greater dispersion in the origin of Mexican migrants not only from the capital city, but from as far away states as Oaxaca and Guerrero.

TABLE 1 — Distribution of Mexican Migrants to the United States by Top Eight States of Origin in Mexico for Selected Years (in percentages)

	1924* (%)	1957* (%)	1977* (%)	1984* (%)	1993-94** (%)
Total, top 8 states	79.2	74.3	71.0	68.7	67.8
Baja California	—	—	17.0	10.2	0.6
Coahuila	9.2	5.5	—	—	6.3
Chihuahua	—	6.9	7.7	15.7	5.2
Durango	5.8	8.6	3.9	—	5.7
Guanajuato	10.8	13.2	9.0	7.7	17.9
Guerrero***	—	—	—	4.4	3.5
Jalisco	20.0	10.8	13.7	10.0	6.9
Michoacán	14.5	11.8	11.5	11.1	10.9
Nuevo León	5.8	—	—	—	3.3
San Luis Potosí	—	5.6	3.7	—	7.4
Sonora	4.1	—	—	5.2	1.1
Zacatecas	9.0	11.9	4.5	4.4	4.5
Distrito Federal	—	—	—	—	7.5

Sources: García y Griego, M., in Cornelius and Bustamante (1989) and *Encuesta sobre Migración en la Frontera Norte* (1994).
*   Estimates of migrants based on data from deportee samples.
**   This column has been estimated from those who returned to Mexico voluntarily.
*** Guerrero and Morelia are combined.

A significant finding with respect to the Mexican labor market is that most of the emigrants held a job before departing for the United States: only 27.5 percent of them did not have a job in Mexico prior to emigrating (EMIF, 1995).[7] This seems to corroborate the belief that international migration no longer serves as a safety valve for Mexican unemployment. As Durand (1994) puts it, "By the end of the 1980s, the metaphor [safety valve] has definitively lost support..." The impact of these flows in the Mexican labor markets can be significant. According to the 1990 Mexican Census, migrants who are engaged in seeking work either in the U.S. or in towns other than their place of residence (in this case the border towns) represent about 7.5 percent of the total economically active population. Data from the *Encuesta Nacional de Dinámica Demográfica* (ENADID, 1992) shows that approximately 2 million people worked or looked for work in the United States during the five years prior to 1992 (ENADID, 1992). This represents about 6 percent of the total Mexican labor force.

The EMIF survey provides further evidence in support of the thesis that Mexican-U.S. migration is circular. It shows that about 73 percent of emigrants surveyed had already traveled to the United States seeking work at least once, and about half of the total flow of migrants had been in the United

States three or more times. This is not entirely a labor-supply phenomenon, but it is also a response to labor demand in the United States. Previous research appeared to indicate that Mexican migration was mostly destined to agricultural activities and hence the seasonality of the agricultural cycles explained this circularity of the flow of Mexican migrants.

Today, although 36.7 percent of emigrants who held a job in Mexico prior to emigration were engaged in work in the agricultural sector, only 27.1 percent found a job in the United States in the agricultural sector (EMIF, 1995). It seems that some migrants are able to leave their low paying jobs in the Mexican agricultural sector and manage to find relatively higher paying jobs in the U.S. industrial or service sectors. The proportions are not so disparate for the other two sectors of the economy: 20.4 percent of migrants worked in the Mexican industrial sector prior to emigration, but 17.9 percent of those working in the U.S. do so in the industrial sector, while 15.4 percent worked in the Mexican service sector and 16% do so in the U.S. service sector.[8] These new data show that the agricultural sector may no longer be the largest magnet for migrants. Previous research has also pointed out the importance of network connections in facilitating migration and in determining the length of stay in the United States.[9] The EMIF survey shows the importance of family networks in a successful U.S. migration experience, 51 percent of migrants had at least one relative in the United States during their last trip, while only 17.9 percent did not have any relatives at all in the country of destination. A final characteristic of migrants in this flow relates to the possession of legal documents. The majority of first-time migrants do not have documents to work or live in the United States and the second phase of the survey indicates that this percentage is rising.

The Flow of Migrants from the United States to Mexico

The flow of migrants to and from Mexico attests to the notion of the circularity of Mexico-U.S. migration. The section above discussed some of the characteristics of the flow to the United States. This section will deal with the flow from the United States to Mexico. If indeed Mexico-U.S. international migration can be characterized as a circular process, then this second group of migrants captured in the EMIF survey should essentially show that it is made up of a group with similar socioeconomic characteristics as the previous group.[10] Therefore, only the total flows are reported here.

The flow of migrants from the United States to Mexico totaled approximately 1,102,000 migrants. As in the case of the flow from Mexico to the United States, this flow can be divided into two subgroups. The first subgroup is part of the circular flow of migrants, since they are Mexican

citizens returning from the United States to their main residence in Mexico. During the EMIF survey period (March 1993-March 1994), 518,000 migrant workers with residence in Mexico came back from the United States. The second subgroup can be regarded as permanent migrants, since their residence is in the United States but they are visiting Mexico at the time of the interview. This group of returnees is made up of a flow of 478,000 Mexicans whose residence was in the United States but who returned to Mexico for a visit during the survey year.[11] This group represents a considerable number of permanent migrants who keep close links with their place of origin. This finding has an important implication for the persistence of the flow of remittances into Mexico. Nevertheless, it should be noted that there are significant differences between the first and second phase of the survey in the composition of this flow. Unlike the Mexico-U.S. flow, the flow from the United States to Mexico increased by 11.7 percent between the two periods. But while the returned flow of Mexicans residing in the United States increased by 66.7 percent, the returned flow of Mexicans residing in Mexico decreased by 44.1 percent. This change in the return flows, along with the observation that the proportion of migrants planning to stay in the United States for periods longer than six months also increased in the second phase of the survey, seems to imply that recent changes in immigration laws might have the reverse results that were intended. Migrants are choosing to stay in the United States for longer periods rather than risk crossing on a continuous basis, thus decreasing the flow of migration but not the stock of migrants in the U.S.

In sum, the EMIF survey shows that given the magnitude of the flows involved, it is unlikely that migration between Mexico and the United States will decline in the near future. On the contrary, it seems that this migration phenomenon is a well diversified process with respect to the origin of migrants as more states become part of this process. Further diversification also occurs in the United States as migrants move away from employment in the traditional agricultural sector of the U.S., thereby expanding the networks of influence for future migrants. Mexican migration does not serve to relieve unemployment, since a large majority of migrants had a job prior to emigrating, but migration possibly relieves underemployment in the informal sector given the socioeconomic characteristics of these migrant workers. This is supported by the finding that an increasing number of migrants now come from the urban areas. Lastly, there might be significant changes in the proportion of migrants without legal documents and in the proportion of those staying in the United States for longer periods of time which have important implications for U.S. immigration policies.

It is worth noting that, due to the nature of the EMIF survey, both migrant

flows studied here are underestimated, because it did not cover two other flows. The EMIF survey did not include those traveling by air (which is most likely a group made up of documented migrants) and it also ignored those who live in the border towns but cross to the U.S. border cities to work on a daily basis, besides others who cross for tourist reasons. This latter group is sometimes referred to as "daily commuters." Thus, the estimates of migration flows could only be interpreted as a minimum estimate of the true volume of migration.

Financial Flows from Mexican Labor Migration

The financial flows from migration are the money transfers that Mexican migrants in the U.S. sent back to their families in Mexico or that they themselves bring back home upon their return. These flows are also known as remittances. Despite the renewed interest in collecting data on migration flows for the largest labor exporter country in the world, researchers face two main obstacles in estimating remittances at the national level. One is the lack of information about the number of undocumented migrant workers,[12] and the other is the lack of information about the money that migrants bring back with them upon their return to Mexico.

The only available time-series data on remittances can be constructed by using the International Monetary Fund Balance of Payments Statistics (1994). Table 2 below reports IMF data supplemented with Lozano's[13] estimates of the flow of remittances into Mexico for the category of pocket

TABLE 2 — Total Financial Flows Associated with Mexican Labor Migration, 1986-92 (in millions of U.S. dollars)

Year	Labor Income ($)	Workers' remittances ($)	Migrants' transfers/ Pocket Transfers ($)[1]	Social Security ($)[2]	Total Flow ($)
1986	328	1,290	777	172	2,567
1987	368	1,478	812	189	2,847
1988	415	1,897	847	172	3,331
1989	456	2,213	882	180	3,731
1990	497	2,492	917	220	4,126
1991	544	2,414	952	235	4,145
1992	557	2,706	987	241	4,491

Source: *IMF Balance of Payments Statistics Yearbook, 1994*;
[1]   Lozano (1993);
[2]   U.S. Department of Health and Human Services, 1986-92.

TABLE 3 — Remittances Compared to Selected Economic Indicators, 1986-92
(in millions U.S. $)

	1986	1987	1988	1989	1990	1991	1992
Remittances	2,567	2,847	3,331	3,731	4,126	4,145	4,491
Agricultural Exports	2,098	1,543	1,670	1,754	2,162	2,373	2,112
Foreign Direct Investment	1,522	3,248	2,595	2,242	2,633	4,762	4,393
International Foreign Aid	252	156	174	99	160	278	316
Current Account	-1,673	3,968	-2,443	-3,958	-7,117	-13,785	-22,811
Trade Balance	4,599	8,433	1,668	-645	-4,433	-11,329	20,677

Source: Banco de México, *Annual Report 1993*; *Economic Indicators*, Banco de México, 1987-92; *World Development Report*, World Bank, 1995; *Human Development Report*, UNDP, 1994.

transfers. In Table 2, labor income is the factor income accruing to temporary laborers (staying less than 12 months) working abroad. Workers' remittances is the value of the private transfers from workers residing abroad for more than a year. Migrant transfers are a set of counter entries to the flows of goods and changes in financial assets that arise from migration (change of residence), and are thus equal to the net worth of migrants (IMF: 1994). Typically, there is no data under the migrants transfers category.

The table above was constructed by replacing the IMF's Migrants' Transfer category, for which there is no data available, with a flow not considered at all in these statistics, namely pocket transfers. This is derived from Lozano's (1993) work where "pocket transfers" are defined as the money brought personally by migrants when they return to Mexico.[14] The previous discussion showing the significant number of returnees to Mexico on a yearly basis and the circularity of Mexico-U.S. migration warrants the inclusion of this flow. This is calculated for circular and permanent migrants. The last category included in Table 2 is Social Security, which includes financial flows that the U.S. Social Security Administration sends to Mexico to retired and disabled workers, spouses, children, and widows. The beneficiaries may be Mexican or U.S. citizens residing in Mexico, but this flow is assumed to be a part of the social process of labor migration which represents unrequited transfers that will be consumed in Mexico and therefore they are included here (Lozano: 1993).

The flow of remittances into Mexico continues to steadily grow. The *Banco*

de México reported about 4.7 billion dollars for 1997, and recently the ambassador of Mexico in Los Angeles, U.S.A., stated that Mexicans residing in the United States sent about 5,000 million dollars during 1998.[15] The importance of these flows for the Mexican economy in relation to some selected macroeconomic indicators is shown in Table 3 below. Remittances significantly exceed foreign aid and agricultural exports, and it was until recently Mexico's third largest earner of foreign exchange behind oil exports and tourism. In most years they also exceed foreign direct investment, and remittances have completely or partially covered the trade balance deficits, thereby helping to improve the trade deficit.

The importance of remittances for the Mexican economy warrants a closer look at these financial flows from migration surveys available. This is even more crucial when one looks at the impact of these flows by state. It was shown that migrants are not randomly distributed geographically, but rather come from specific regions within Mexico. It is expected that the flow of remittances will also be directed back to these communities in the northwestern part of Mexico. The number of recipients in Mexico varies depending on the survey used. For example, while the National Income-Expenditure survey of 1996 shows that 1.1 million households in Mexico received remittances, the mid-decade population census indicates that this is around 600,000 households.[16] The EMIF survey is also in this range, with an estimate of 680,000 households receiving remittances in the 1996/97 period.

In spite of the dispute about the exact number of recipients, it is worth noting that the unequal distribution of remittances in Mexico has different impacts on the respective state economies. The following table shows the

TABLE 4 — Remittance and Federal Expenditure Flows by State, 1996
(in millions of U.S. $)

STATE	Remittances	Federal Expenditures			As a % of total expenditures in:		
		Education	Health	Item XXVI[1]	Education	Health	Item XXVI
Guanajuato	652.3	312.1	190.9	45.8	209%	342%	1,424%
Jalisco	523.9	438.6	389.4	43.0	119%	135%	1,218%
Michoacán	360.1	389.7	152.5	71.2	92%	236%	506%
San Luis P	283.7	267.1	115.3	46.6	106%	246%	609%
Guerrero	211.9	406.1	121.4	111.8	52%	175%	190%
Chihuahua	186.4	259.2	216.0	43.7	72%	86%	427%
Zacatecas	179.6	174.8	65.9	40.7	103%	273%	441%

Source: Data presented at the Congress on Migration held at El Colegio de la Frontera Norte on October 30th, 1998.

[1] Item XXVI in the federal budget is destined towards social projects to abate poverty.

magnitude of these flows at the state level compared to federal expenditures for certain key social items in the six highest states which receive remittances.

As seen in Table 4, for the highest recipient state (Guanajuato), remittance flows alone are greater than the combined federal expenditure in education, health and social spending. At a minimum, remittances represent more than half of the expenditures for education in Guerrero and more than 15 times the federal expenditure on social projects in Guanajuato. It should be noted that further studies may have to take into account a regional perspective to capture more accurately the impacts of remittances on their different economies.

The EMIF survey (1994-95) allows a minimum estimate of the total flow of remittances into Mexico to be calculated and it also provides information about those migrants who sent them. The relevant population in the survey is those migrants, circular and permanent, who returned from the United States during the survey period. Table 5 shows that the total flow of remittances into Mexico from Mexican nationals in the United States was just over $2 billion dollars around 1993-94. More importantly, it shows that permanent migrants, even though residing permanently in the United States, continue to send remittances. This group of permanent migrants did send a smaller gross amount than the temporary migrants, but remittances from permanent migrants represent about 28 percent of the total flow. The permanent migrant group sent 39 percent of their earnings, while the circular migrants sent 55 percent of their earnings. Permanent migrants earn more while in the U.S., possibly due to their experience and longer assimilation into the U.S. labor market, but they sent about the same per migrant as the temporary group. It is suggested in the literature that as migrants become assimilated into the U.S. labor market and move permanently with their families, they send less remittances, but it would be a serious mistake to ignore remittances sent by permanent migrants altogether.

TABLE 5 — Total Flow of Remittances into Mexico by Type of Migrant (in thousands U.S. $)

	Circular Migrants		Permanent Migrants	
	Gross amount	Avg. Monthly amount	Gross amount	Avg. Monthly amount
Earnings	$285,297	$851 per migrant	$190,336	$1,218 per migrant
Remittances	$158,824	$474 per migrant	$74,296	$476 per migrant
Yearly Remittances[1]	$1,470,110	$4,385 per migrant	$585,045	$3,745 per migrant
Total for both groups	$2,055,155			

Source: Derived from data in Corona (1993).

[1] Based on the average number of months worked in the U.S., which is 9.25 months.

The EMIF survey also sheds some light on the characteristics of those migrants who sent remittances. The flow of remittances is affected by the volume of migrants in any given year, but even if the volume of migration does not change much, changes in the composition of the migration flow can change significantly the volume of remittances. Out of the group considered to be circular migrants, 22.7 percent did not work and therefore did not send any remittances during the survey period. In addition, 26.1 percent of circular migrants worked during their stay in the United States but did not send any remittances. This leaves 51.2 percent who worked in the U.S. and also sent remittances. Out of the group considered to be permanent migrants, 13 percent did not work and did not send remittances, while 55.7 percent worked but did not send remittances. Finally, only 31 percent of permanent migrants worked and sent remittances to Mexico. This could be explained if one assumes that some permanent migrants already have their immediate family in the United States and therefore they have less incentive to repatriate part of their earnings. But 31 percent can still be considered a large percentage of migrants who keep ties with Mexico through their extended family or because they intend to reside permanently in Mexico in the future.

The results of the EMIF survey also show that 98.8 percent of those who sent remittances are males; 65 percent being married and head of the household. Remittance-sending migrants come from larger households, with 34.1 percent having five or more dependents at home. These workers are also more experienced in the labor market since only 21.3 percent did not work before emigrating and a high percentage, 65.9 percent, are found to have legal documents to work in the United States. Of these workers, 81.3 percent had already worked in the United States at least once, and the average number of migrations for work purposes was 6.88 per migrant. Seventy percent of migrants have relatives in the United States and frequently return for family visits.

In summary, the observation that the average number of trips to the U.S. per migrant is increasing, and that almost two-thirds of remittance-sending migrants have legal documents to work, leads to the conclusion that these financial flows are unlikely to decrease significantly in the near future. This is true even if some temporary migrants decide to stay permanently in the U.S., since permanent and circular migrants send on average a similar amount of remittances per migrant.

The Uses of Remittances in Mexico

The research on remittances deals with their volume, determinants and their impact on the sending communities (Russell: 1986, 1992). Worldwide flows

are significant in absolute as well as relative terms (Russell and Teitelbaum: 1992). As shown in Table 3, these financial flows associated with labor migration are also relatively important for the Mexican economy. Several authors have analyzed the impact of migration and remittances on the labor-sending countries (Straubhaar: 1988, 1985a, 1985b), while others have considered the impact of migration in the context of development[17].

Among the country studies, Mexico has attracted a great deal of attention and the literature is very extensive,[18] but the conclusions they reach about the economic consequences of labor migration in Mexico are somewhat pessimistic. This view is based on several Mexican community studies that show that U.S. earnings are mostly spent on current personal consumption and very little on productive investment.[19] Despite this evidence, there is also evidence to support the opposite view. Several studies show that there is some productive investment and local economic growth in some receiving communities.[20] One of the main problems for both sides of the debate is the degree of generalization that can be based on such community studies.

But there is also a conceptual problem in these studies that is brought to light by the so-called new economics of labor migration. This view argues that individuals migrate to overcome market failures in their sending regions. These market failures are the lack of access to insurance and credit markets by migrants. According to this view, households send members abroad to diversify their sources of household income and/or to accumulate capital for the purchase of large consumption items or the establishment of a new business (Massey and Parrado: 1994, Stark: 1981). The management of risk and the liquidity that remittances allow the receiving households can be partially observed in the indirect effect of remittances on production and household income.

These indirect effects refer to the impact of remittances on non-remittance receiving households as well as the effects beyond the initial expenditure. Remittances have an impact beyond the local economy because spending often is directed towards commercial towns some distance from the recipients' communities. Given the magnitude of the remittance flows and the likelihood of continued migration, an economy-wide study is more suitable to make some generalization at the national level and capture the effects beyond the initial inflow of remittances as well as the effects on non-remittance receiving households. As stated in a recent article by Taylor et al. (1996), models designed to estimate emigration's indirect effects are conspicuously absent. These indirect effects can only be captured in an economy-wide model such as a social accounting matrix (SAM) or a general equilibrium model (CGE) to quantify the effects on the sending economies.

The relevant question in the EMIF survey was designed to obtain

qualitative data from the migrant about the main use of remittances by the recipient household in Mexico. The results of the EMIF data only show the ranking of importance from among six categories. The six categories are: 1) to buy land and agricultural equipment; 2) to start, expand or buy a business; 3) to buy or improve your house; 4) to buy a car or durable goods; 5) to pay debts and 6) to meet current consumption needs. For the purposes of this study, a more useful categorization would include the amount spent in each category as shown in Table 6. For this reason, I use the results of an ongoing survey of 22 migrant communities in Western Mexico conducted over a period of more than ten years by a team of researchers headed by Douglas Massey, from the University of Chicago, and Jorge Durand, from the University of Guadalajara. The total yearly flow of remittances estimated from this survey is over $1.5 billion around 1988.

Studies of the direct uses of remittances are not consistent in their classification of such expenditures. Disagreements persist about the proper identification of uses between consumption and investment, and even a broad categorization of spending is not without some definitional problems. For example, one of the common uses of remittances is expenditure on new housing and housing improvement. This could be said to have an impact on hygiene and physical well-being of the residents and therefore raise their productivity, but others claim that it only pushes prices up thus fueling inflation without adding to the capital stock of the nation. The categories of purchase of land and the repayment of debt also pose some problems. The acquisition of assets by migrants may be considered a rational decision given alternative forms of investments in the sending regions, but even in this case, its ultimate impact for the rest of society will depend on what the seller of these assets does with the proceeds. Household surveys do not allow us to trace second round effects from such transactions.

A useful classification of remittance expenditures is to break them down into savings/investment, where savings is interpreted in the narrow economic sense as deferred consumption; another category is present consumption, and a residual category with other or unknown expenditures. From a strictly macroeconomic point of view, savings and investment can be treated as being equal.

As shown in Table 6, about fifty-five percent of remittances are used for consumption and almost 21 percent for savings/investment.[21] This has led investigators to conclude that "U.S. migration perpetuates a state of economic dependency that undermines the prospects for development at both the regional and national levels" (Durand et al., 1995).

These conclusions are problematic for two reasons: first, migrant workers are not financial intermediaries. It is the role of banks and financial

TABLE 6 — Estimated Amount of Remittances and Savings Spent on Savings/ Investment and Consumption

Spending Category	Remittances (U.S. $)	Savings[1] (U.S. $)	Total amount (U.S. $)	Percent (%)
Savings/Investment	3,134,706	1,950,034	5,084,740	20.84
Purchase of Farmland	58,552	11,734	70,286	0.29
Purchase of Livestock	41,021	59,866	100,887	0.41
Start-up Business	461,314	564,716	1,026,030	4.21
Purchase of Tools	0	10,358	10,358	0.04
Saved	160,157	226,046	386,203	1.58
Construction/repair of house	1,582,061	906,995	2,489,056	10.20
Payment of Debts	831,601	151,275	982,876	4.03
Motor vehicles	0	19,044	19,044	0.08
Consumption	10,943,017	2,493,815	13,436,832	55.10
Consumer goods	843,081	365,760	1,208,841	4.96
Recreation	198,560	417,800	616,360	2.53
Family health and Maintenance	9,901,376	1,710,255	11,611,631	47.61
Other/Ambiguous[2]	1,798,452	663,592	2,462,044	10.09
Unknown	3,389,889	17,497	3,407,386	13.97
Total	19,266,064	5,124,938	24,391,002	100.00

Source: Author using D. Massey and E. Parrado (1994) data.

[1] Savings are what migrants brought with them upon their return.

[2] These expenditures could not be classified by the authors as either production or consumption.

intermediaries to increase the money supply and expand credit by collecting savings and channeling them into the most productive uses. Indeed, there is some significant amount directed towards productive investment, as shown above in the category savings/investment. According to Massey and Parrado (1994), 84 million dollars from remittance money were invested in Mexican enterprises. This is a significant inflow given that the traditional sending regions are among the poorest in Mexico. Considering that gross private domestic savings in Mexico in 1990 was 13.2 percent, migrants' savings and investment behavior do not seem to be significantly different than the rest of the population (OECD: 1997). Second, a look at the direct uses of remittances ignores the indirect effects that consumer spending could have on output, income and employment in Mexico; that is, it ignores the second and further round effects of the initial spending. Remittances may have strong multiplier effects throughout the Mexican economy, even when some increased demand is satisfied through imports.

Thus, the view from prior investigators concluding that U.S. migration perpetuates a state of economic dependency that undermines the prospects for development is mistaken (Durand *et. al.*: 1996). I propose to shed new light on the impact of remittance flows on output, income and employment, in order to obtain a better understanding of their contribution to national economic growth. The following section will analyze the macroeconomic impact of remittances on the Mexican economy through the use of a Social Accounting Matrix for Mexico in 1989.

Modeling the Impact of Remittances

The literature on planning models often is based on the input-output methods developed by Leontief (1941). Social Accounting Matrices (SAMs) extend the analysis of intersectoral flows in the production accounts to government, financial and household sectors. On the one hand, they show the structure of production, the distribution of value added among the factors of production and the distribution of income between households. On the other hand, they force a reconciliation with the system of national accounts.

The actual Social Accounting Matrix for Mexico (henceforth called SAM89) was constructed for the 1989 year and it is shown in Table 7. The entire SAM89 consists of 32 endogenous accounts and 3 exogenous accounts. The explanation for the different account abbreviations is found in Appendix 1. The SAM89 is built around the input-output matrix, which is represented by the square matrix in the rows 10-18 and the columns 1-9.

The SAM89 in Table 7 shows that agriculture represents 8.5% of domestic production and 9.8% of GDP in 1989. Agriculture counts 82.1 percent of their production as value added, while the service sector counts 72.2 percent. Labor income accounts for about 34 percent in the agricultural sector, while it is only 23.5 percent in the industrial sector and about 25 percent in the service sector. The structure of external trade shows that exports and imports are roughly in equilibrium with 82,038 in imports and 81,147 in exports and a trade deficit of 891. Imports are dominated by the chemical, auto-electrical parts and other small industries sectors, which together account for almost 60 percent of total imports. Wage income to urban workers accounts for 87 percent of total wage income, while savings average 11 percent of income.

The household sector was disaggregated according to the characteristics of the head of the household. Households were ranked in groups according to their income and then according to their position in their jobs and their education levels to reach seven categories useful to distribute remittance income among them. It was assumed that the households heading the urban business sector and the rural business sector do not receive remittance

TABLE 7 — 1989 Mexico SAM Income Flows

	AGRIC	LIVEST	RENOR	FOOD	TEXMP	QUIDE	OTIND	ELAU	SERCO	AGRIC	LIVEST	RENOR	FOOD	TEXMP	QUIDE	OTIND	ELAU	SERCO
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. AGRI										40,004.0								
2. LIVES											23,403.8							
3. RENOR												13,784.0						
4. FOOD													79,521.8					
5. TEXMP														47,104.0				
6. QUID															50,627.0			
7. OIND																47,146.0		
8. ELAU																	23,007.0	
9. SERCO																		397,786.0
10. AGRIC	932.0	4,713.0		10,597.0	1,831.0	86.0	299.0	16.0	94.0									
11. LIVEST	5.0	73.0		15,673.0	137.0	18.0		1.0	63.0									
12. RENOR	26.0	77.0	3,035.0	27.0	91.0	2,900.0	4,406.0	734.0	2,647.0									
13. FOOD	68.0	2,412.0		10,487.0	641.0	821.0		5.0	356.0									
14. TEXMP	332.0	279.0	36.0	1,330.0	10,979.0	1,661.0	738.0	1,182.0	7,690.0									
15. QUIDE	3,591.0	1,210.0	381.0	1,510.0	4,639.0	16,642.0	1,682.0	1,996.0	13,233.0									
16. OTIND	398.0	354.0	762.0	2,196.0	661.0	1,078.0	14,022.0	4,587.0	17,658.0									
17. ELAU	233.0	248.0	64.0	163.0	211.0	138.0	752.0	8,635.0	6,444.0									
18. SERCO	2,345.0	2,279.0	1,893.0	11,796.0	6,758.0	9,283.0	6,715.0	7,402.0	72,862.0									
19. CAURB			10,608.0	22,796.0	16,641.6	16,399.0	19,970.5	10,580.3	198,284.0									
20. CARUR	24,054.0	8,322.0								161.7	26.5							
21. LURLE			1,137.0	2,184.0	2,521.2	2,484.4	3,032.0	1,602.9	33,752.0									
22. LURHE			1,534.0	2,949.0	3,408.2	3,358.5	4,082.0	2,166.9	45,570.0									
23. LRULE	3,745.0	1,933.0																
24. LRUHE	850.0	439.0																
25. FAMIL	7,770.6	1,613.9																
26. UWKLE																		
27. UWKHE																		
28. UBUS																		
29. AWKLE																		
30. AWKHE																		
31. AGBUS																		
32. CAMPE																		
33. GOVT			274.0	3,066.0	97.0	63.0	75.0	33.0	37,629.0	474.4	82.8	43.0	414.0	1,655.9	1,839.9	1,778.6	858.6	
34. CAPIT																		
35. ROW										4,042.0	589.0	1,032.0	5,358.0	5,439.0	11,417.0	18,486.0	19,029.0	16,646.0
TOTAL	44,349.6	23,952.9	19,724.0	84,774.0	48,616.0	54,932.0	55,773.5	38,941.0	436,282.0	44,682.1	24,102.1	14,859.0	85,293.8	54,198.9	63,883.9	67,410.6	42,894.6	414,432.0

TABLE 7 (cont.) — 1989 Mexico SAM Income Flows

	CAURB	CARUR	LURLE	LURHE	LRULE	LRYHE	FAMIL	UWKLE	UWKHE	UBUS	AWKLE	AWKHE	AGBUS	CAMPE	GOVT	CAPIT	ROW	TOTAL
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
1. AGRIC															2,679.1		1,667.0	44,350.1
2. LIVEST															50.1		499.0	23,952.9
3. RENORE																	5,940.0	19,724.0
4.FOOD															1,086.2		4,166.0	84,774.0
5. TEXMP																	1,512.0	48,616.0
6. QUIDE																	4,305.0	54,932.0
7. OTIND																	8,628.0	55,774.0
8. ELAU																	15,934.0	38,941.0
9. SERCO																	38,496.0	436,282.0
10. AGRIC								2,713.1	2,916.5	9,240.5	1,186.7	228.5	3,971.1	3,706.3	114.0	2,037.0		44,681.6
11. LIVEST								1,143.6	1,292.6	3,862.8	124.1	27.4	428.0	361.6	16.0	876.0		24,102.1
12. RENOR										10.0				1.0		905.0		14,859.0
13. FOOD								11,314.3	13,972.6	34,131.8	1,052.7	222.2	3,576.5	3,141.6	53.0	3,039.0		85,293.7
14. TEXMP								2,982.2	4,395.1	13,803.4	512.0	150.0	1,915.7	1,467.0	811.0	3,933.9		54,199.2
15. QUIDE								2,120.6	2,966.3	7,704.2	417.2	86.0	1,277.1	1,133.6	607.0	2,687.9		63,883.9
16. OTIND								662.7	1,051.7	8,346.3	95.4	3.0	510.8	266.7	645.0	14,112.6		67,410.2
17. ELAU								861.5	1,147.3	2,247.1	167.0	46.0	553.4	466.8	398.0	20,119.9		42,894.9
18. SERCO								25,390.4	38,876.2	133,157.0	1,020.6	252.5	3,783.4	2,802.6	26,935.0	60,881.0		414,431.6
19. CAURB																	8,185.2	303,464.6
20. CARUR																		32,564.2
21. LURLE																		46,713.5
22. LURHE																	1,125.9	64,194.5
23. LRULE																		5,678.0
24 .LRUHE																		1,289.0
25. FAMIL																		9,384.5
26. UWKLE			46,714.0												11,156.1		1,079.6	58,949.7
27. UWKHE				64,194.9											14,715.8		1,218.0	80,128.7
28. UBUS	199,993.0														63,321.0			263,314.0
29. AWKLE					5,678.0			168.0	224.9			178.6					466.3	6,715.9
30. AWKHE						1,289.0											189.7	1,478.7
31. AGBUS		23,409.6																23,409.6
32. CAMPE		9,154.6					9,384.6	289.2	387.2								466.3	19,681.9
33. GOVT	24,719.0								8,506.2	28,002.0		274.4	4,376.5					114,262.2
34. CAPIT	53,656.0							11,302.6	4,391.7	22,809.2	2,140.2	8.2	3,017.1	6,335.7	-8,326.0		13,257.0	108,591.8
35. ROW	25,096.8																	107,134.8
TOTAL	303,464.8	32,564.2	46,714.0	64,194.9	5,678.0	1,289.0	9,384.6	58,948.3	80,128.5	263,314.3	6,715.9	1,478.7	23,409.6	19,681.9	114,262.4	108,592.2	107,134.9	

income. The full name of the endogenous and exogenous accounts is found in Appendix 1.

SAM Multiplier Analysis

The main use of SAMs is to develop SAM multiplier analysis. The use of SAM multipliers is based on the partition of accounts into endogenous and exogenous accounts. Endogenous accounts are those for which changes in the level of expenditure follow a change in income. Exogenous accounts are those for which changes in the level of expenditure are independent of income.[22] A "shock" or "injection" is given by a change in elements of the exogenous account. The model solves for the equilibrium level of all the endogenous accounts. All multipliers are demand-driven.

We can write the total income received by the endogenous accounts as $Yn = n + x$, or alternatively as $Yn = (I - An)^{-1}X$, where $(I - An)^{-1}$ is a matrix of SAM multipliers Ma and I is an nxn identity matrix, thus, we can write: $Yn = MaX$. Each element of the matrix of multipliers, mij constitutes the direct and indirect effect of a one unit increment in the exogenous account j on the i-th endogenous account. Once the matrix Ma is known, this equation relates how the "injections" of the exogenous accounts affect the income of the endogenous accounts. Table 8 shows this Ma matrix of SAM coefficients.

After a suitable disaggregation of the uses of remittances into the appropriate endogenous accounts in the Social Accounting Matrix, the analysis of multipliers was applied to examine the effects on output and employment from an exogenous injection. In this case, the exogenous injection is the amount of remittances in 1989. Thus, the output and employment multipliers obtained will allow an analysis of the full effects beyond the initial direct expenditures out of remittances.

Empirical Results

The matrix Ma of SAM multipliers is shown in Table 8. The final demand vector [X], which in this case is the vector of remittances when pre-multiplied by the matrix of SAM multipliers [Ma], shows the potential output added to the economy because of the inflow of remittances. The amount of the inflow of remittances into Mexico for 1989 was estimated using the data from the time series constructed in Table 2. The pattern of remittance expenditure was not possible to calculate directly because of lack of information in the EMIF survey, which only shows 5 grouped categories, thus we used a more

TABLE 8 — Matrix Ma of SAM Coefficients (I)

	AGRIC	LIVEST	RENOR	FOOD	TEXMP	QUIDE	OTIND	ELAU	SERCO	AGRIC	LIVEST	RENOR	FOOD	TEXMP	QUIDE	OTIND
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 .AGRI	1.2734	0.4178	0.1002	0.3064	0.1514	0.1020	0.1015	0.0881	0.0970	1.1411	0.4060	0.0930	0.2857	0.1316	0.0808	0.0710
2. LIVES	0.0834	1.0988	0.0603	0.2695	0.0667	0.0612	0.0569	0.0517	0.0581	0.0750	1.0671	0.0559	0.2513	0.0580	0.0485	0.0398
3. RENOR	0.0288	0.0316	1.1909	0.0270	0.0318	0.0980	0.1259	0.0556	0.0313	0.0259	0.0307	1.1047	0.0252	0.0276	0.0777	0.0880
4. FOOD	0.2966	0.3801	0.2178	1.3749	0.2357	0.2273	0.2061	0.1872	0.2104	0.2667	0.3694	0.2021	1.2819	0.2049	0.1801	0.1441
5. TEXMP	0.1711	0.1667	0.1115	0.1421	1.3582	0.1483	0.1215	0.1358	0.1247	0.1538	0.1620	0.1034	0.1325	1.1804	0.1175	0.0850
6. QUID	0.2498	0.2256	0.1324	0.1690	0.2400	1.4300	0.1463	0.1662	0.1403	0.2243	0.2193	0.1228	0.1576	0.2086	1.1332	0.1023
7. OIND	0.0838	0.0923	0.1116	0.1021	0.0912	0.0983	1.2881	0.1831	0.1070	0.0753	0.0897	0.1035	0.0952	0.0793	0.0779	0.9009
8. ELAU	0.0336	0.0357	0.0227	0.0260	0.0247	0.0228	0.0298	1.1548	0.0292	0.0302	0.0347	0.0210	0.0243	0.0215	0.0181	0.0208
9. SERCO	0.7775	0.8415	0.9453	0.9404	1.0047	1.0288	0.9424	0.9656	1.9693	0.6987	0.8179	0.8769	0.8768	0.8732	0.8153	0.6591
10. AGRIC	0.3054	0.4666	0.1119	0.3423	0.1691	0.1139	0.1134	0.0984	0.1083	1.2746	0.4535	0.1038	0.3191	0.1470	0.0903	0.0793
11. LIVEST	0.0859	0.1018	0.0621	0.2775	0.0687	0.0631	0.0586	0.0533	0.0599	0.0773	1.0989	0.0576	0.2587	0.0597	0.0500	0.0410
12. RENOR	0.0310	0.0341	0.2058	0.0291	0.0343	0.1056	0.1357	0.0600	0.0338	0.0279	0.0331	1.1909	0.0271	0.0298	0.0837	0.0949
13. FOOD	0.3182	0.4077	0.2336	0.4021	0.2528	0.2437	0.2210	0.2008	0.2257	0.2861	0.3963	0.2167	1.3749	0.2197	0.1932	0.1546
14. TEXMP	0.1969	0.1918	0.1283	0.1636	0.4122	0.1707	0.1398	0.1562	0.1435	0.1770	0.1864	0.1190	0.1525	1.3582	0.1352	0.0978
15. QUIDE	0.3152	0.2847	0.1671	0.2133	0.3028	0.5426	0.1846	0.2098	0.1771	0.2830	0.2767	0.1550	0.1988	0.2632	1.4300	0.1291
16. OTIND	0.1198	0.1319	0.1595	0.1460	0.1304	0.1406	0.4120	0.2618	0.1530	0.1077	0.1282	0.1480	0.1361	0.1134	0.1114	1.2881
17. ELAU	0.0626	0.0665	0.0422	0.0485	0.0461	0.0426	0.0555	0.2887	0.0545	0.0563	0.0647	0.0392	0.0453	0.0401	0.0337	0.0388
18. SERCO	0.8100	0.8767	0.9848	0.9798	1.0468	1.0719	0.9818	1.0060	1.0099	0.7279	0.8521	0.9136	0.9135	0.9097	0.8495	0.6867
19. CAURB	0.6209	0.6688	1.2525	0.9544	1.1131	1.1005	1.1060	0.9945	1.0993	0.5579	0.6500	1.1619	0.8898	0.9674	0.8721	0.7735
20. CARUR	0.7209	0.6102	0.0758	0.2614	0.1060	0.0771	0.0753	0.0661	0.0733	0.6497	0.5938	0.0703	0.2437	0.0921	0.0611	0.0527
21. LURLE	0.0956	0.1020	0.1662	0.1314	0.1729	0.1697	0.1696	0.1548	0.1794	0.0859	0.0992	0.1541	0.1225	0.1503	0.1345	0.1186
22. LURHE	0.1290	0.1378	0.2243	0.1774	0.2336	0.2293	0.2288	0.2090	0.2422	0.1160	0.1339	0.2080	0.1654	0.2030	0.1817	0.1600
23. LRULE	0.1143	0.1240	0.0133	0.0476	0.0182	0.0136	0.0132	0.0116	0.0129	0.1024	0.1204	0.0124	0.0444	0.0158	0.0107	0.0092
24. LRUHE	0.0259	0.0281	0.0030	0.0108	0.0041	0.0031	0.0030	0.0026	0.0029	0.0232	0.0273	0.0028	0.0101	0.0036	0.0024	0.0021
25. FAMIL	0.2287	0.1472	0.0216	0.0719	0.0310	0.0220	0.0216	0.0189	0.0209	0.2050	0.1430	0.0201	0.0670	0.0270	0.0174	0.0151
26. UWKLE	0.0956	0.1020	0.1662	0.1314	0.1729	0.1697	0.1696	0.1548	0.1794	0.0859	0.0992	0.1541	0.1225	0.1503	0.1345	0.1186
27. UWKHE	0.1290	0.1378	0.2243	0.1774	0.2336	0.2293	0.2288	0.2090	0.2422	0.1160	0.1339	0.2080	0.1654	0.2030	0.1817	0.1600
28. UBUS	0.4092	0.4408	0.8254	0.6290	0.7336	0.7253	0.7289	0.6554	0.7245	0.3677	0.4284	0.7657	0.5864	0.6375	0.5748	0.5098
29. AWKLE	0.1180	0.1280	0.0148	0.0498	0.0198	0.0151	0.0147	0.0130	0.0144	0.1058	0.1244	0.0137	0.0464	0.0172	0.0119	0.0102
30. AWKHE	0.0259	0.0281	0.0030	0.0108	0.0041	0.0031	0.0030	0.0026	0.0029	0.0232	0.0273	0.0028	0.0101	0.0036	0.0024	0.0021
31. AGBUS	0.5182	0.4386	0.0545	0.1879	0.0762	0.0554	0.0541	0.0475	0.0527	0.4670	0.4269	0.0505	0.1752	0.0662	0.0439	0.0379
32. CAMPE	0.4325	0.3199	0.0448	0.1468	0.0628	0.0456	0.0447	0.0393	0.0436	0.3886	0.3111	0.0416	0.1369	0.0546	0.0361	0.0313
Prod. Mult	2.9981	3.2900	2.8926	3.3576	3.2045	3.2168	3.0185	2.9881	2.7674	2.6910	3.1968	2.6833	3.1304	2.7851	2.5493	2.1111
Own mult.	1.2734	1.0988	1.1909	1.3749	1.3582	1.4300	1.2881	1.1548	1.9693							
Induced Y	1.7285	1.5953	1.3329	1.3331	1.3030	1.2434	1.2438	1.1217	1.2597	1.5542	1.5512	1.2365	1.2429	1.1324	0.9854	0.8699

Table 8 (Cont.) — Matrix Ma of SAM Coefficients

	ELAU	SERCO	CAURB	CARUR	LURLE	LURHE	LRULE	LRYHE	FAMIL	UWKLE	UWKHE	UBUS	AWKLE	AWKHE	AGBUS	CAMPE
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
1. AGRI	0.0472	0.0931	0.0936	0.2832	0.1687	0.1571	0.2853	0.2970	0.2977	0.1687	0.1571	0.1420	0.2853	0.2970	0.2775	0.2977
2. LIVES	0.0277	0.0558	0.0560	0.0890	0.1026	0.0974	0.0895	0.0992	0.0901	0.1026	0.0974	0.0850	0.0895	0.0992	0.0886	0.0901
3. RENOR	0.0298	0.0301	0.0175	0.0226	0.0254	0.0266	0.0226	0.0247	0.0222	0.0254	0.0266	0.0266	0.0226	0.0247	0.0228	0.0222
4. FOOD	0.1004	0.2019	0.2007	0.3148	0.3749	0.3608	0.3169	0.3484	0.3204	0.3749	0.3608	0.3045	0.3169	0.3484	0.3126	0.3204
5. TEXMP	0.0728	0.1197	0.1016	0.1731	0.1545	0.1619	0.1695	0.2182	0.1678	0.1545	0.1619	0.1541	0.1695	0.2182	0.1752	0.1678
6. QUID	0.0892	0.1347	0.0974	0.1722	0.1580	0.1619	0.1788	0.1973	0.1749	0.1580	0.1619	0.1477	0.1788	0.1973	0.1711	0.1749
7. OIND	0.0982	0.1027	0.0686	0.0761	0.0866	0.0916	0.0716	0.0714	0.0706	0.0866	0.0916	0.1041	0.0716	0.0714	0.0783	0.0706
8. ELAU	0.6194	0.0281	0.0175	0.0318	0.0301	0.0307	0.0325	0.0402	0.0318	0.0301	0.0307	0.0265	0.0325	0.0402	0.0318	0.0318
9. SERCO	0.5179	1.8902	0.7915	0.7080	1.1243	1.2081	0.7027	0.8171	0.6890	1.1243	1.2081	1.2010	0.7027	0.8171	0.7155	0.6890
10. AGRIC	0.0528	0.1040	0.1046	0.3163	0.1884	0.1755	0.3187	0.3317	0.3326	0.1884	0.1755	0.1586	0.3187	0.3317	0.3100	0.3326
11. LIVEST	0.0286	0.0575	0.0577	0.0916	0.1057	0.1003	0.0922	0.1021	0.0928	0.1057	0.1003	0.0876	0.0922	0.1021	0.0912	0.0928
12. RENOR	0.0322	0.0324	0.0189	0.0244	0.0273	0.0286	0.0243	0.0266	0.0239	0.0273	0.0286	0.0287	0.0243	0.0266	0.0246	0.0239
13. FOOD	0.1077	0.2166	0.2152	0.3376	0.4021	0.3870	0.3399	0.3737	0.3436	0.4021	0.3870	0.3266	0.3399	0.3737	0.3353	0.3436
14. TEXMP	0.0838	0.1377	0.1169	0.1992	0.1778	0.1863	0.1950	0.2511	0.1930	0.1778	0.1863	0.1773	0.1950	0.2511	0.2016	0.1930
15. QUIDE	0.1125	0.1700	0.1229	0.2173	0.1993	0.2043	0.2256	0.2490	0.2207	0.1993	0.2043	0.1864	0.2256	0.2490	0.2159	0.2207
16. OTIND	0.1404	0.1469	0.0981	0.1088	0.1239	0.1310	0.1024	0.1020	0.1009	0.1239	0.1310	0.1488	0.1024	0.1020	0.1119	0.1009
17. ELAU	1.1548	0.0523	0.0326	0.0594	0.0561	0.0573	0.0606	0.0750	0.0593	0.0561	0.0573	0.0494	0.0606	0.0750	0.0594	0.0593
18. SERCO	0.5396	1.9693	0.8246	0.7377	1.1714	1.2586	0.7321	0.8513	0.7178	1.1714	1.2586	1.2513	0.7321	0.8513	0.7454	0.7178
19. CAURB	0.5334	1.0551	1.5163	0.5652	0.7647	0.8053	0.5626	0.6484	0.5547	0.7647	0.8053	0.7834	0.5626	0.6484	0.5692	0.5547
20. CARUR	0.0355	0.0703	0.0707	1.1858	0.1279	0.1198	0.1871	0.1968	0.1941	0.1279	0.1198	0.1073	0.1871	0.1968	0.1825	0.1941
21. LURLE	0.0830	0.1722	0.0815	0.0864	1.1192	0.1263	0.0859	0.0994	0.0846	0.1192	0.1263	0.1237	0.0859	0.0994	0.0871	0.0846
22. LURHE	0.1121	0.2325	0.1101	0.1167	0.1610	1.1705	0.1160	0.1342	0.1142	0.1610	0.1705	0.1670	0.1160	0.1342	0.1176	0.1142
23. LRULE	0.0062	0.0124	0.0124	0.0311	0.0225	0.0211	1.0313	0.0331	0.0324	0.0225	0.0211	0.0189	0.0313	0.0331	0.0306	0.0324
24. LRUHE	0.0014	0.0028	0.0028	0.0071	0.0051	0.0048	0.0071	1.0075	0.0074	0.0051	0.0048	0.0043	0.0071	1.0075	0.0069	0.0074
25. FAMIL	0.0101	0.0201	0.0202	0.0556	0.0365	0.0341	0.0560	0.0587	1.0582	0.0365	0.0341	0.0306	0.0560	0.0587	0.0546	0.0582
26. UWKLE	0.0830	0.1722	0.0815	0.0864	1.1192	0.1263	0.0859	0.0994	0.0846	1.1192	0.1263	0.1237	0.0859	0.0994	0.0871	0.0846
27. UWKHE	0.1121	0.2325	0.1101	0.1167	0.1610	1.1705	0.1160	0.1342	0.1142	0.1610	1.1705	0.1670	0.1160	0.1342	0.1176	0.1142
28. UBUS	0.3516	0.6954	0.9993	0.3725	0.5039	0.5307	0.3708	0.4273	0.3656	0.5039	0.5307	1.5163	0.3708	0.4273	0.3751	0.3656
29. AWKLE	0.0069	0.0138	0.0133	0.0325	0.0268	0.0254	1.0327	0.1555	0.0339	0.0268	0.0254	0.0202	1.0327	0.1555	0.0320	0.0339
30. AWKHE	0.0014	0.0028	0.0028	0.0071	0.0051	0.0048	0.0071	1.0075	0.0074	0.0051	0.0048	0.0043	0.0071	1.0075	0.0069	0.0074
31. AGBUS	0.0255	0.0506	0.0508	0.8524	0.0920	0.0861	0.1345	0.1415	0.1395	0.0920	0.0861	0.0771	0.1345	0.1415	1.1312	0.1395
32. CAMPE	0.0211	0.0418	0.0410	0.3900	0.0787	0.0741	0.1096	0.1152	1.1138	0.0787	0.0741	0.0622	0.1096	0.1152	0.1069	1.1138
Prod. Mult	1.6027	2.6563	1.4444	1.8709	2.2251	2.2962	1.8694	2.1134	1.8644	2.2251	2.2962	2.1917	1.8694	2.1134	1.8734	1.8644
Induced Y	0.6016	1.2091	1.2988	1.8575	1.9867	2.0178	1.8567	2.0806	1.8589	1.9867	2.0178	1.9708	1.8567	2.0806	1.8569	1.8589

disaggregated version of remittance expenditures by spending category shown in Table 6. We believe this break down constructed specifically for migrant communities in the north western part of Mexico more accurately reflects the expenditure patterns of Mexican migrants. Furthermore, since the data has been collected over a number of years, it reflects some of the changes in consumption patterns of remittance-receiving households.

The policy simulation shown in Table 9 consists of analyzing the impact of 5,170 millions of pesos (US $2,058 mil.) into the Mexican economy as a result of remittances sent by Mexican migrants in the United States during 1989.[23] As can be observed in this Table, total production increased by 11,097 millions of pesos or US $4,418 million, which is 1.37% of total Mexican output, and total income increased by 10,174 millions of pesos or US $4,050 million, which is approximately 2.24% of total income.

Table 9 shows that the agricultural and livestock sector output increases by 1,562.8 millions of pesos (US$ 622 mil); the industrial sector's output increases by 4,260.1 millions of pesos (US$ 1,696 mil.), and the service sector's output increases by 5,274.6 millions of pesos (US$ 2,100 mil.). The highest gross impact is in the service industries, in the food processing industry and in the agricultural sector. The effects on the latter two sectors is expected, since these sectors correspond to the spending category (family maintenance) with the greatest percentage out of remittance expenditures by migrant households in Mexico. Thus, remittances induced an increase in total output that was more than double the initial transfer.

Table 10 shows the relative effects of remittance inflows on household incomes. This is done to separate the initial effects from the second and further round effects.

The 1989 remittance multipliers show that on the production side, the largest multiplier effect is in the communal and private services, including construction, electricity, gas and water sector. A $100 increase in remittances induces a $102.02 increase in the output of this sector, reflecting some of the major expenditure items of migrants such as construction, medical care and education, which are included in this sector. There are also significant effects on the processed food and the agricultural sectors. A $100 increase in remittances stimulates a $35.31 in the processed food sector, while the increase in the agricultural sector is $20.52. The stimulus to the textile, wood, paper, and printing sector, and the chemical products and derivatives sector, shows that there is rural demand for industrial production. The table shows that the second and further round effects are significant, since there are about $1.02 cents for every dollar. This adds up to a whole production multiplier of around 2.02.

In gross terms, remittances also induced an increase in total household

TABLE 9 — Simulation of the Impact of Remittances

	Base values X	Shock F	Impact X	% change
1. AGRI	44,349.66	0.00	1,060.82	2.39%
2. LIVES	23,952.91	0.00	501.96	2.10%
3. RENOR	19,724.00	0.00	128.88	0.65%
4. FOOD	84,774.01	0.00	1,825.36	2.15%
5. TEXMP	48,616.00	0.00	850.61	1.75%
6. QUID	54,932.00	0.00	861.87	1.57%
7. OIND	55,774.00	0.00	430.82	0.77%
8. ELAU	38,941.00	0.00	162.60	0.42%
9. SERCO	436,282.00	0.00	5,274.57	1.21%
19. CAURB	303,464.59	0.00	3,704.28	1.22%
20. CARUR	32,564.24	0.00	754.62	2.32%
21. LURLE	46,713.51	0.00	575.72	1.23%
22. LURHE	64,194.51	0.00	777.36	1.21%
23. LRULE	5,678.00	0.00	130.09	2.29%
24. LRUHE	1,289.00	0.00	29.53	2.29%
25. FAMIL	9,384.55	0.00	219.69	2.34%
26. UWKLE	58,949.67	1,632.00	2,207.72	3.75%
27. UWKHE	80,128.65	1,841.00	2,618.36	3.27%
28. UBUS	263,314.00	0.00	2,441.24	0.93%
29. AWKLE	6,715.92	705.00	886.97	13.21%
30. AWKHE	1,478.66	287.00	316.53	21.41%
31. AGBUS	23,409.60	0.00	542.47	2.32%
32. CAMPE	19,681.94	705.00	1,160.32	5.90%
33. GOVT	114,262.24	0.00		
34. CAPIT	108,591.77	0.00		
35. ROW	107,134.80	0.00		
Total Production	807,345.58		11,097.49	1.37%
Induced Income	453,678.44	5,170.00	10,173.61	2.24%
Change Gov't	114,262.00		1,633.40	1.43%
Change Savings	108,592.00		2,161.07	1.99%
Change Imports	107,135.00		1,375.5	1.28%

income of 10,173.61 million of pesos (US$ 4,050 mill.) or almost double the initial transfer. In all cases, the impact on household income is greater than the initial transfer. More interestingly, as it is also shown in Table 10, two household institutions, namely urban business and rural business, did not receive remittances at all but saw their incomes increase by $47.22 and $10.49, respectively. This attests to the notion that remittances have spillover effects over the non-migrant population and a further indication of rural demand for urban products. The spillover effects may have other negative effects though. There is also some indication that there is an unequal distribution of

Table 10 — Relative Effects of a $100 Increase in Remittance Income

Production effects		Household income effects			
			Multiplier	1st round	2nd round
	$100		Effect	$100	
1.AGRI	20.52	26. UWKLE	42.70	31.57	11.14
2. LIVES	9.71	27. UWKHE	50.65	35.61	15.04
3. RENOR	2.49	28. UBUS	47.22	0.00	47.22
4. FOOD	35.31	29. AWKLE	17.16	13.64	3.52
5. TEXMP	16.45	30. AWKHE	6.12	5.55	0.57
6. QUID	16.67	31. AGBUS	10.49	0.00	10.49
7. OIND	8.33	32. CAMPE	22.44	13.64	8.81
8. ELAU	3.15				
9. SERCO	102.02	Total	196.78	100.00	96.78

remittance effects, because even though the low education urban and rural households receive 67.18 percent of the initial inflow, they only receive about 30 percent of the total effect. For the *campesino* household the effect is less dramatic but of equal direction, they receive 13.64 percent of the initial inflow but only 11 percent of the total effect. As noted in previous community research, the *campesino*, rural low education worker and the urban low education worker have a higher participation rate in the flow of migration than the other groups, as reflected in the initial distribution of remittances, but their consumption patterns generate income spending that favors the rural and urban high education household sector.

Finally, it can also be observed from these results that there are some leakages in the multiplier process in the form of government, savings and imports. The initial amount of remittances induce almost a 42 percent increase in savings, or approximately 2 percent of gross savings. There is also a relatively modest increase in induced imports of about 1.28 percent of total imports. Thus it seems that most of the induced output is supplied by domestic sources. This may be due to the fact that most remittances are spent in immediate consumption and that most remittance-receiving households have a relatively lower propensity to import.

Another useful experiment in the analysis of the impact of remittances on economic growth is to look at the employment generation due to the increased aggregate demand described above. For this purpose, an employment multiplier was constructed using the same matrix of multipliers and the pattern of consumption out of remittances (Bulmer-Thomas: 1982). Under the assumption that there is a fixed proportional relationship between output and employment we have: $1 = gx$, where 1 is a vector of employment requirements and g is a diagonalized matrix formed from a vector of

employment coefficients. By pre-multiplying the matrix of SAM multipliers, $(I-A)^{-1}$ by η, we obtain: $1^* = L^*Dx$, so that the Lij element of L^* measures the employment created directly and indirectly when the jth final demand changes by one unit and $S_i l_{ij}$ measures the total employment created throughout the economy.

The results of the potential employment effects from remittances are found in Table 11 below. Using the data from the uses of remittances survey, we disaggregated the inflow of remittances into the respective spending categories. This is the vector of final demand in millions of pesos. The resulting employment vector indicates that 325,225 potential jobs could be created as a result of the increased demand in output generated by remittance expenditures, which amounts to 1.46% of total employment in Mexico. These effects are also reported in terms of the potential employment in the particular sector, where the initial final demand occurs (own sector effects), and in terms of the potential employment required to satisfy the additional intermediate demand due to remittances. The agricultural and service sector effects are mostly within their own sectors, while the industrial sector effects are small and mostly due to intermediate demand effects.

In terms of the total amount of remittances, it could be said that there is one job created for each 11,129 pesos of remittance inflow or, in other words, one potential job could be created for every US$ 4,431 of remittances. This is very encouraging, but it should only be taken as an upper limit of the possible effects because of two assumptions made in this model. One, we assumed

Table 11 — Potential Employment Effects from Remittances

Output Sector	Final Demand (in million pesos)	Employment effects			As a % of total employment
		Employment Vector	Own sector Effects	Other sector Effects	
1. AGRI	469,138.33	135,607.46	110,946.73	24,660.73	2.54%
2. LIVES	20,680.00	12,972.88	3,612.16	9,360.72	1.83%
3. RENOR	0.00	2,402.81	611.31	1,791.50	0.88%
4. FOOD	896,754.05	14,881.76	1,829.60	13,052.16	2.20%
5. TEXMP	514,268.41	15,138.36	3,689.06	11,449.30	2.34%
6. QUID	581,080.14	8,497.79	1,219.11	7,278.67	2.54%
7. OIND	217,140.00	3,830.05	520.70	3,309.34	1.14%
8. ELAU	263,670.00	5,084.25	1,195.48	3,888.77	1.02%
9. SERCO	656,590.00	126,809.78	96,657.46	30,152.32	0.94%
Total Final Demand	3,619,320.92				
Total Employment		325,225.12	220,281.61	104,943.51	1.46%

there is a fixed proportional relationship between output and employment and two, we assumed that labor is homogeneous.

Although just over 80 percent of the potential jobs would be created in the agricultural and service sectors, the industrial sectors show very little potential. Nonetheless, the results show a 2 percent increase in the number of jobs created in the food processing and the textile/wood sectors. In a country like Mexico that has about one million new entrants a year into the labor force, this number of potential jobs is very significant. Although there are increasingly more migrants with previous work experience in Mexico who leave their jobs to migrate to the United States, remittances seem to serve as a mitigating factor that may deter other potential migrants from joining the flow of migration to the U.S. by creating new jobs at home.

Conclusions and Policy Recommendations

We have seen that the true impact of migration and remittances requires an economy-wide model, because of the indirect or spillover effects of these inflows. These effects, beyond the initial expenditure of remittances, are significant in terms of output, income and potential employment creation, and therefore they have an overall positive effect on economic growth. Given the data available, it seems that the production multiplier and the income multiplier are around 2. This should warrant a concerted effort to gather data on the inflow of remittances and its uses by the receiving households in Mexico. The *Banco de México's* recent efforts with respect to the first point are welcome, but there is still no national representative data on the uses of remittances by households in Mexico.

Efforts to gather data should be accompanied by a policy to encourage greater repatriation of remittances into Mexico. New technologies in financial intermediation allow the instant transfer of money to the countries of origin, but Mexican migrants still tend to use very traditional methods with very high transaction costs. The diffusion of information to ease the transferability of these financial flows to Mexico and concerted efforts to encourage repatriation of dollars are needed. This is more urgent in light of recent media articles detailing the systematic abuses of money transfer agencies, such as the lower exchange rates and excessive service fees.

Several development schemes have been created in the Middle East to mobilize remittances for investment, such as higher term deposit rates for remittances and foreign currency denominated accounts, as well as some tax schemes. In India, institutions have been established to channel these resources or to complement them with government subsidies in the promotion of small industries. In Thailand there are returning migrant training programs

and schemes to use seed money for migrants' start-up businesses. Pakistan has allowed imports of machinery, vehicles and certain capital goods at lower rates of duty for those living abroad. Other countries have experimented with cooperatives or special funds to create jobs for migrants or their families. In light of these experiences, further research is needed to understand the factors governing the use of remittances for new productive investment. The relevant question should be why in some communities remittances are used for investment in productive activities while in others there is no such use (Massey and Bassem: 1992). The insights of the new economics of labor migration should be particularly relevant in this regard (Stark and Bloom: 1985).

Mexico does not have any official policy to channel these resources to productive uses and the last official report of migrants and remittances dates back to the early 1960s (Morales: 1981). Furthermore, to the extent that the impact of remittances on the agricultural sector is significant, and it is known that this sector has a greater concentration of the poor, government investment could target the remittance-receiving households and the non-migrant population in the receiving communities to complement migrants' financial flows. Nonetheless, no amount of remittances will compensate for the lack of government investment in infrastructure and other economic activities that create an environment suitable for productive investment. Thus, there is also a need to complement these increasing financial flows with sound macroeconomic policies.

Appendix 1 — Construction of the 1989 Mexico SAM Income Flows

The 1989 Mexico SAM Income Flows was constructed using the 1989 SAM elaborated at El Colegio de México by Carlos Miguel and modified by Alister Crowe at the University of California, Davis. The main changes with respect to the previous matrices is the desegregation of the industrial sector into four sectors and the aggregation of the agricultural sector into only one sector. Thus the matrix presented here is a 35X35 square matrix with 33 endogenous accounts and 3 exogenous accounts.

The composition of the accounts is as follows:

Endogenous Accounts

Activities: 9 productive activities

AGR	Agriculture, forestry, game and fishing.
LIVES	Livestock and other animal production.
RENOR	Non-renewable resources, petroleum, and minerals.
FOOD	Processed food.
TEXMP	Textile, wood and paper, including printing.
QUID	Chemical products and derivatives.
OIND	Other manufacturing industries.
ELAU	Home electrical appliances, automobiles and other small manufacturing production.
SERCO	Communal and private services, including construction, electricity, gas, and water.

Commodities: 9 commodities group with the same classification as the activities.

Factors of Production: 7 factors of production

CAURB	Urban capital.
CARUR	Rural capital.
LURLE	Urban labor with low education.
LURHE	Urban labor with high education.
LRULE	Rural labor with low education.
LRUHE	Rural labor with high education.
FAMIL	Family labor.

Institutions: 7 household groups.

UWKLE	Urban worker with low education.
UWKHE	Urban worker with high education.
UBUS	Urban business.
AWKLE	Rural worker with low education.
AWKHE	Rural worker with high education.
AGBUS	Rural business.
CAMPE	*Campesino.*

Exogenous Accounts

GOVT	Government.
CAPIT	Capital.
ROW	Rest of the world.

NOTAS

1. Nayyar, D. (1994).
2. See Stahl and Habib (1989) and Habib (1985) for studies of Bangladesh, and Glytsos (1993) for a recent study of Greece.
3. The National Emigration to the Northern Border and to the United States Survey (ENEFNEU) was carried out during December 1978 and January 1979. It consisted of a small questionnaire to a stratified probability sample of 62,500 households in 115 localities throughout Mexico. See Zazueta and García y Griego (1982).
4. At the request of the Mexican Labor Ministry and the Mexican National Population Council, El Colegio de la Frontera Norte is carrying out a continuous survey of migrant flows to the United States throughout the eighteen most important entry points along the U.S. Mexican border. For the methodology see *Encuesta sobre Migración en la Frontera Norte. Síntesis Ejecutiva* by J. Bustamante, R. Corona and J. Santibáñez. The discussion of Mexican emigration here is based on the results of this survey as found in the *Síntesis Ejecutiva* by Corona and Tuirán (1996).
5. The EMIF survey was initiated in March 1993. Due to funding problems, the survey was discontinued for a few months. The second phase of the survey did not start until December 1994 and it ended in December 1995.
6. Mexican surveys consider an urban area to be a locality with 15,000 or more inhabitants, while a locality with a population lower than 15,000 inhabitants is classified as a rural area (INEGI). This latter category corresponds to the non-urban category in the EMIF survey. In some cases, neither definition will refer to a rural area. For example, a small urban area that has less than 15,000 people would be classified as a rural area. 1.9% of those surveyed did not specify where they came from.
7. The second phase of the survey indicates that the percentage of those without a job prior to emigration increased when the comparison is made between similar periods in both phases.
8. The rest of the population is made up of those who did not work prior to emigrating (27.5 percent) and for those who were in the United States: 26.6 percent did not go to the U.S. to work, 3 percent only stayed for a few hours and 5.9 percent did not work in the reference period.
9. See Taylor, J.E. (1986) and Stark (1991).
10. The importance of this group of migrants also lies in the information they can provide about last month's events, i.e. migration, remittance flows, etc. The migrants from Mexico to the U.S. provide information based on their last trip to the U.S., which in some cases might have been many years ago.
11. The remaining 106,000 could not be properly classified into the two subgroups.
12. See Diez-Canedo (1984).
13. Lozano's (1993) survey of the literature on remittances to Mexico provides the most comprehensive study to date. He divides remittance studies based on their methodology and describes two methods of estimating the flow of remittances, namely estimation by sample and estimation by demographic and economic indicators. The former refers to models that relate the estimated size of the population of migrant workers in the United States with estimates of the average amounts of money sent to Mexico. The latter refers to samples from official transfers through the telegraph and the banking system.
14. Other authors refer to this type of flow as savings (See Massey and Parrado, 1994).
15. This is an underestimation, since he made this statement on December 12, 1998, and it is known that December is the highest single month in the amount remitted.
16. "Congress on Migration" held at El Colegio de la Frontera Norte on the 30th of October, 1998.
17. See Griffin (1976), Stahl and Arnold (1986), Stahl (1989, 1990), and Taylor *et al.* (1996).

18. For example, see Bustamante and Cornelius (1989).
19. Durand, J., E. Parrado and D. Massey (1995) provide an extensive list of such studies; among them, Dinerman: 1982, González and Escobar: 1990, López: 1986, Shadow: 1979, Reichert: 1981, Stuart and Kearney: 1981, Mines: 1984, Fernández: 1988 and Weist: 1973, 1979, 1984.
20. Durand, J. and D. Massey mentioned the following: Trigueros and Rodríguez (1988), Massey *et al.* (1987), Goldring (1990). Evidence is provided for the case of El Salvador in López and Seligson (1991).
21. Massey and Parrado's (1994) classification showed that about 66 percent of remittances went to the categories of current consumption (including construction or repair of house), and only 6.53 percent went to what they called production, which included the categories under Savings/Investment in Table 5 except for the last three categories.
22. E. Sadoulet and A. de Janvry (1995). I shall follow their exposition of SAM multipliers closely.
23. To convert these figures to US$, I use the average 1989 exchange rate of 2.5118 pesos per dollar from the Banco de México Annual Report for 1990.

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