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# Migradollars: The remittances and savings of Mexican migrants to the USA

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**Abstract.** In this article, we use new data from 22 communities to estimate the total flow of dollars back into Mexico as a result of migration to the United States. Our estimates include remittances sent while working abroad and money brought back on return trips; they incorporate transfers by temporary as well as permanent US workers; they include money transferred by legal as well as illegal migrants; and they include funds sent or brought by household heads as well as other family members. We estimate that US$ 24 million in 'migradollars' flowed into the sample communities during the survey year. In some places, the flow of US money equalled or exceeded the value of locally earned income. When generalized to all of Western Mexico, our sample suggests a regional flow of US$ 1.5 billion; and when our data are inserted into an estimation model developed earlier by Lozano Ascencio, we estimate the total flow at US$ 2 billion for Mexico as a whole. Although most of this money was spent on consumption, investments in productive activities were significant, and directly or indirectly, we conclude that migradollars play an extremely important role in Mexican economic production.

**Key words:** Mexico, Migration, Remittances, Savings, Undocumented

## Introduction

Interest in the size of the monetary flow into Mexico from the United States has a long history. At the turn of the century, Mexican journalists noted the unusual quantity of money orders arriving in rural communities from migrants working north of the border (Durand 1986, 1988). Gamio (1930) later sampled these postal orders to estimate the average annual inflow at around US$ 4.9 million during the period 1920–28 (about US$ 37 million in 1990 dollars). Of these funds, 60 percent went to just three states: Guanajuato, Jalisco, and Michoacán. His work, however, was criticized by Santibañez (1930) for not including money sent via telegraph, for excluding cash brought home on personal visits, and for assuming that all money orders must have been sent by migrants working abroad.

When Mexico–US migration ceased during the 1930s (Hoffman 1974), interest in the transnational flow of dollars waned. As migration revived under the Bracero Program of the 1940s and 1950s, however, Mexican policy makers exhibited a renewed interest in migrant remittances as a source of foreign exchange. The final reports of Presidents Ruiz Cortines and Miguel

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Aleman, for example, offered specific estimates of capital remitted by migrants working abroad (Morales 1981).

It was not until Mexican immigration began a sustained increase during the 1960s and 1970s that academic investigators returned to the topic. Cornelius (1978) sampled 230 adult male migrants located in nine communities in the state of Jalisco during January 1975. He found that 79 percent of those interviewed reported remitting money home on a regular basis, and 65 percent reported bringing money with them when they returned (what Lozano Ascencio (1993) calls 'pocket transfers'). The average amounts remitted and returned were US$ 170 per month and US$ 301 per trip. Cornelius multiplied these proportions and amounts by an assumed 2 million Mexican migrant workers and estimated the total capital flow at US$ 1.9 billion in 1975.

Díez Canedo derived a much smaller total for 1975 using a methodology similar to Gamio's; he sampled money orders under $500 sent from the USA to Mexico on one working day each month by people with Spanish surnames. Extrapolating from this sample, he estimated the total amount sent back to Mexico during the year at US$ 318 million. His method, however, omitted funds sent by telegraph, pocket transfers, remittances sent by legal immigrants, and funds cleared through banks other than the one large institution he studied (Lozano Ascencio 1993).

García y Griego & Giner de los Ríos (1985) combined data from a variety of binational sources to develop an estimate of the total transfers from temporary and permanent undocumented migrants in the USA. Their methodology yielded a figure of US$ 1.8 billion in 1984, quite close to Cornelius's earlier estimate of US$ 1.9 billion in 1975 (although the latter's figure becomes US$ 3.4 billion when ad justed to 1984 dollars). Although more complete than the Díez Canedo estimates, however, those of García y Griego & Giner de los Ríos exclude remittances by legal immigrants and pocket transfers by long-term residents of the United States (Lozano Ascencio 1993).

Keely & Tran (1989) used data tabulated by the International Monetary Fund on 'unrequited private transfers' to examine trends in capital flows between Mexico and the United States from 1970 to 1985. Their figures include only money transferred through monitored channels and do not incorporate informal and non-cash remittances. The data showed that in 1975 US$ 59 million dollars were transferred into Mexico from the USA, far less than the amounts reported earlier by Cornelius or Díez Canedo. But this figure increased substantially during the late 1970s, and grew again after the onset of Mexico's economic crisis in 1982. By 1984, private transfers totalled US$ 2.3 billion.

The Banco de México (1991) adopted a sampling methodology similar to that used by Gamio and Díez Canedo to develop estimates for 1990. Each month they sampled funds transferred through Mexico's two main banks and tabulated money orders, personal checks up to US$ 2,500, and person-to-

person telegraph orders. The sample was inflated to represent a population enumerated in a census of remittances conducted during August of 1990 at branch banks and currency exchanges throughout Mexico. The Banco de México estimated the total flow to be US$ 1.98 billion in 1990. This figure, however, excluded documents cashed abroad by individuals, money remitted through specialized companies (e.g., American Express), and funds transferred by wire (Lozano Ascencio 1993).

The Banco de México estimates, nonetheless, correspond quite closely to those of Cornelius (1978) and García y Griego & Giner de los Ríos (1985), and also to newer estimates prepared by Nolasco (1991). Using a variety of demographic and economic sources, she developed a procedure to estimate the quantity of funds transferred to Mexico by temporary and permanent residents of the United States with and without documents. She estimated the annual flow of migrant dollars to be about US$ 1.8 billion in 1991: US$ 1.2 billion from temporary workers and US$ 600 million from permanent immigrants, both legal and illegal.

The most recent estimate was derived by Lozano Ascencio (1993), who was critical of earlier studies because all tended to exclude some important source of funds. In order to be complete, he argued, an estimate had to incorporate postal orders, telegraph orders, and checks cleared through a variety of financial institutions; it had to incorporate pocket transfers – cash brought back to Mexico by returning or visiting migrants; it had to include transfers made by legal as well as undocumented migrants; and it had to include money sent or brought back by permanent as well as temporary workers abroad.

Lozano Ascencio pieced together data from a variety of sources to estimate the total number of temporary and permanent migrants in the United States during 1980, 1985, and 1990, irrespective of legal status. He then drew upon field studies to estimate the proportion of migrants in each category who remitted and brought back money, and to approximate the average size of their remittances and pocket transfers. The upper and lower values observed across these studies yielded high and low estimates to go with his intermediate estimate, which was based on the cross-study averages.

Lozano Ascencio estimated that US migrants were responsible for a yearly capital flow of US$ 3.15 billion into Mexico as of 1990, with a possible range or US$ 1.71 billion to 4.86 billion. Of this 3.15 billion, 71 percent came in the form of remittances and 29 percent entered through pocket transfers; 58 percent was transferred from temporary migrants working abroad and 42% came from migrants living permanently in the USA. Of the 71 percent entering as remittances, 49 percent came in the form of money orders, 17 percent entered via wire transfers, and 5 percent was remitted in the form of personal checks.

When Lozano Ascencio factored in social security payments made to retired migrants living in Mexico, his intermediate estimate of the capital flow rose to US$ 3.37 billion. Both this figure and the baseline figure of US$

3.15 billion are substantially larger than earlier estimates, which generally range from US$ 1.7 to 2.3 billion. This sum would constitute 1.5 percent of Mexico's gross domestic product and exceeds total direct foreign investment by 31 percent. It equals Mexico's foreign exchange earned through tourism and is only 5 percent lower than earnings from maquila production.

The purpose of this study is to draw upon a new source of data to generate independent estimates of the flow of migradollars into Mexico (borrowing the term for migrant-earned money introduced by Durand [1988]). In doing so, we seek to provide additional confirmation of the crucial role played by US migration in Mexico's economy and to underscore its latent potential as a catalyst for economic development. Drawing on data gathered in 22 Mexican communities scattered throughout the core sending states of Guanajuato, Jalisco, Michoacán, and Nayarit, we estimate the total flow of migradollars into local communities, and then apply other methodologies to develop estimates at the regional and national levels.

## Source of data

The data we employ come from simple random samples gathered in 22 Mexican communities between 1982 and 1992, and from non-random samples of permanent out-migrants from those same communities interviewed in destination areas of the United States over the same period. The Mexican communities were generally sampled during December of the survey year (although interviewing often extended through January), and the out-migrant samples were typically compiled the following summer, after preliminary tabulations from the Mexican samples revealed the most important US destinations. Information about these 22 binational samples is presented in Table 1.

The earliest samples – in Amacueca, Chavinda, El Salto, and Guadalajara – were gathered in 1982 as part of an early field investigation finished in 1983 and reported in Massey et al. (1987). Work in the remaining communities began in 1987; each year from 1987 through 1991 two to four communities were sampled using ethnosurvey methods (Massey 1987). The questionnaire solicited basic social, economic, and demographic data about the household, household head, spouse, children (present or not), and other household members. Every person who had ever been to the United States was identified and basic information was gathered about the first and most recent trip. Household heads with US experience were asked a detailed series of questions about their latest trip to the United States, and all heads provided a detailed life history that included histories of fertility, marriage, property ownership, work, and border-crossing.

The 22 communities were chosen to provide a range of populations, economic bases, and ethnic compositions. They include small, agrarian communities such as Santa María del Valle and San Diego de Alejandría and large,

*Table 1.* Characteristics of Mexican communities sampled for study of migration to the United States

| Community name | State | 1990 population | Year of survey | Households on sampling frame | Size of sample | Sampling fraction | Size of US sample | Estimated ratio of expatriate to home community | Correctly weighted US sample |
|---|---|---|---|---|---|---|---|---|---|
| *Metropolitan areas* | | | | | | | | | |
| Guadalajara | Jalisco | 2,870,417[c] | 1982 | 831[a] | 200 | 0.241 | 0 | 0.086 | 17 |
| León | Guanajuato | 867,920[c] | 1987 | 861[a] | 200 | 0.232 | 0 | 0.024 | 5 |
| Morelia | Michoacán | 492,901[c] | 1991 | 3,578[a] | 200 | 0.056 | 20 | 0.005 | 1 |
| Irapuato | Guanajuato | 362,915[c] | 1991 | 2,009[a] | 200 | 0.100 | 20 | 0.005 | 1 |
| *Small cities* | | | | | | | | | |
| San Francisco del Rincón | Guanajuato | 52,291 | 1987 | 780[a] | 200 | 0.256 | 20 | 0.211 | 42 |
| Los Reyes | Michoacán | 32,474 | 1989 | 6,776[b] | 200 | 0.029 | 20 | 0.122 | 24 |
| Ameca | Jalisco | 30,882 | 1991 | 1,766[b] | 200 | 0.113 | 20 | 0.159 | 38 |
| San Felipe Torres Mochas | Guanajuato | 20,614 | 1990 | 3,771[b] | 200 | 0.053 | 20 | 0.005 | 1 |
| Ixtlán del Río | Nayarit | 19,645 | 1990 | 4,472[b] | 200 | 0.045 | 20 | 0.364 | 73 |
| Romita | Guanajuato | 16,535 | 1988 | 2,723[b] | 200 | 0.073 | 20 | 0.005 | 1 |
| El Salto | Jalisco | 11,546 | 1982 | 1,903[b] | 200 | 0.105 | 20 | 0.043 | 9 |
| *Towns* | | | | | | | | | |
| Las Varas | Nayarit | 11,541 | 1990 | 2,693[b] | 200 | 0.074 | 20 | 0.506 | 101 |
| Chavinda | Michoacán | 7,437 | 1982 | 1,925[b] | 200 | 0.104 | 20 | 0.488 | 98 |
| Nahuatzen | Michoacán | 7,025 | 1990 | 1,441[b] | 200 | 0.139 | 20 | 0.005 | 1 |
| Ario de Rayón | Michoacán | 6,429 | 1989 | 1,393[b] | 200 | 0.143 | 20 | 0.387 | 77 |
| Amacueca | Jalisco | 5,006 | 1982 | 579[b] | 200 | 0.183 | 20 | 0.120 | 24 |
| Unión de San Antonio | Jalisco | 4,760 | 1988 | 799[b] | 200 | 0.250 | 20 | 0.005 | 1 |
| San Diego de Alejandría | Jalisco | 3,516 | 1988 | 510[b] | 200 | 0.392 | 20 | 0.297 | 59 |
| *Ranchos* | | | | | | | | | |
| Santa María del Valle | Jalisco | 3,098 | 1988 | 534[b] | 200 | 0.375 | 15 | 0.005 | 1 |
| La Yerbabuena | Michoacán | 2,240 | 1989 | 448[b] | 150 | 0.335 | 20 | 0.005 | 1 |
| Mineral de Pozos | Guanajuato | 1,737 | 1988 | 248[b] | 150 | 0.605 | 10 | 0.005 | 1 |
| La Soledad | Guanajuato | 1,080 | 1991 | 143[b] | 100 | 0.699 | 10 | 0.005 | 1 |

[a] Census of neighborhood within metropolitan community.
[b] Complete census of all households in community.
[c] Population of metropolitan area.

diverse metropolitan areas such as Guadalajara and León; they include manufacturing centers such as El Salto and San Francisco del Rincón, fishing villages such as Las Varas, decaying mining towns such as Mineral de Pozos, and small commercial cities such as Ixtlán del Río and San Felipe Torres Mochas. Some of the communities are state capitals (Guadalajara and Morelia), most of the others are the equivalent of county seats, and several are small political dependencies (Santa María, La Yerbabuena, Mineral de Pozos, and La Soledad). Although nearly all of the communities are mestizo (a mixture of European and Amerindian ancestries) one, Nahuatzen, is predominantly Amerindian (Tarascan).

The communities are scattered throughout the states of Guanajuato, Jalisco, Michoacán, and Nayarit, which collectively constitute the core of western Mexico, long the most important source region for Mexican migration to the United States (Gamio 1930; Dagodag 1975; North & Houstoun 1976; Jones 1988). In future years, the sample will be expanded to include communities located in Zacatecas and San Luis Potosí as well. Within each state we hope eventually to compile the samples of the largest city, the second largest city, a set of smaller cities and towns, and one or more rural ranchos.

The sampling frame was constructed by preparing a map of the community, listing all potential dwellings, and then using a table of random numbers to draw households for interviewing. In most cases the entire community was covered by the sampling frame, but in the larger cities (50,000 inhabitants and up), one working class neighborhood was demarcated and sampled in order to conserve resources. Within most communities a sample of 200 households was drawn, although in several of the smaller ranchos the sample size was reduced to 100 or 150. Sampling fractions ranged from 0.029 to 0.699, depending on the size of the target community.

We identified destination communities in the United States from responses to the Mexican survey. After gathering the names and addresses of possible contacts from those places, we sent interviewers abroad during the summer months to interview members of the permanent out-migrant community. Respondents were located using snowball sampling techniques, working from initial contacts (Goodman 1961). In most cases 20 out-migrant households were surveyed, although in some of the smaller communities 10–15 households were sampled. Unfortunately, no US survey was conducted for the Guadalajara or León samples. The Guadalajara sample was omitted owing to a shortage of money in the original project, and out-migrants from León were not contacted because an interviewer dropped out of the study.

Although the size of the US sample was essentially fixed across communities, the actual size of the out-migrant community is likely to vary considerably. One way of estimating the relative number of permanent out-migrants is from the location of children of the household head who are no longer household members. In our survey we gathered information about *all* children of the head, whether or not they were presently considered to be part of the household, taking care to distinguish between members and non-

members. In general, non-member children are offspring who have grown up and left home to form their own households. As relatives of sample members they constitute a network sample of the community (Somoza 1981; Hill 1981; Kalton & Anderson 1986). We determined which of these people were living in the United States and which were living in the home community at the time of the survey and formed the ratio between them to indicate the proportionate size of the US out-migrant community.

These ratios are displayed in the next-to-last column of Table 1. The ratio of 0.211 for San Francisco del Rincón indicates that for every 100 households living in the sample community, about 21 are estimated to live in out-migrant settlements in the United States. In a proportionately-weighted sample of the binational community, therefore, our US sample would contain 42 households to go with the 200 households we interviewed in Mexico. We thus know that our 20-household sample was too small. Methods for overcoming this limitation are discussed below.

The proportionately-weighted US sample sizes for the various communities are shown in the last column of Table 1. According to these data, the largest out-migrant communities were those in Las Varas, Chavinda, Ario de Rayón, and San Diego de Alejandría, all of which have long and well-developed migratory traditions that have given rise to well-established settlements in the United States. Other communities either have a poorly developed migrant tradition (such as Mineral de Pozos) or they have evolved a pattern of repeated seasonal migration that does not involve settlement abroad (such as La Yerbabuena, whose seasonal migratory pattern was well-documented by Reichert & Massey [1979]).

una moneda al aire o te va bien o te va mal

Information on remittances and pocket transfers comes from two questions we asked of migrant household heads concerning their most recent trip to the United States. The first question was 'How much per month did you send your family in Mexico?' and the second was 'How much money did you bring back when you returned?' These questions were posed to US residents as well as seasonal migrants and made no distinctions on the basis of legal status, thereby allowing us to estimate remittances and pocket transfers by all of the migrant populations defined by Lozano Ascencio (1993). Since our questions did not specify how the money was transferred, moreover, it represents an estimate of the *total* amount remitted or brought back. It does not, however, include the value of in-kind transfers such as consumer or capital goods, and does not include social security payments to retirees. By focusing only on cash payments transferred by Mexicans working in the United States, our estimates understate somewhat the total capital flow and represent a conservative estimate of the economic effect of US migration.

**Remittances by US migrants**

Table 2 presents estimates of the total amounts remitted by migrant house-

hold heads in our sample during the 12 months prior to the survey. The first column shows the number of migrants who reported being in the United States during the survey year; the second column gives the proportion who reported remitting money back home; and the third column states the average amount of the remittance, given a particular trip duration. The numerator for the average – total remittances reported in the sample – is shown in the last column of the table. Since the surveys occurred in different years, this and all subsequent tables adjust figures to 1990 constant dollars.

In the Mexican samples, the figures in the last column were derived by multiplying monthly remittances by trip durations and then summing across migrants. For trip durations over one year, the monthly remittance was multiplied by 12 to yield annualized figures corresponding to the 12 months prior to the survey. For durations of less than 12 months, we multiplied the monthly remittances by the actual number of months reported. Since there is heterogeneity in trip duration, this factor is important in determining the total amount remitted (a variable that was not properly controlled by Lozano Ascencio [1993]). Average remittances were calculated by dividing total remittances by the number of remitters. The last column therefore equals the product of the first three columns, with small deviations attributable to rounding error.

For the US samples, we employed a different procedure to estimate total remittances because of the discrepancy between the actual and proportionately-weighted sample sizes. We used the samples actually gathered in the United States (10–20 households per community) to estimate the proportions remitting and the average amount remitted. Then we multiplied these proportions and averages by the sample size that would have been required to yield a proportionately weighted US sample (taken from the last column of Table 1) to generate the total remittances shown in the last column of Table 2. Thus, the last column in the table exactly equals the product of the first three columns, with no rounding error.

Since Guadalajara and León lacked US samples, we estimated their proportions remitting and average remittances using information from the Mexican surveys and the other US samples. In the case of Guadalajara, the Mexican samples reveal a proportion remitting of 0.50 compared to an average of 0.73 across all communities. Thus, we multiplied the ratio 0.50/0.73 by the 20-community average from the US samples (0.42) to yield an estimate of 0.29 for Guadalajara's US sample. Likewise, since the Mexican samples revealed Guadalajara's average remittance to be US$ 3,713 compared to an average of US$ 2,383 for all communities, we used the ratio 3,713/2,383 to adjust the 20-community average from the US samples to yield US$ 3,855 for Guadalajara. Parallel procedures were used to derive estimates for León.

As the table shows, two factors are critical in determining the flow of remittances into Mexican communities: the overall prevalence of US migrants, and the relative number of migrants living abroad. Places with both

si se ve como una solución que mitiga la pobreza,
aun así no perdura en el tiempo por estos dos factores

a high prevalence of migration and a large community of settled out-migrants generally display the largest capital flows. In San Diego de Alejandría, for example, returned migrants reported sending US$ 106,185 home and settled migrants added another US$ 87,582; other communities in this category were Chavinda, Ario de Rayón, and Las Varas. The next largest flows are observed in places that either had a high prevalence of migration (as in La Yerbabuena) or a sizeable out-migrant community (as in Ixtlán del Río), but not both. The smallest flows, logically enough, occur in communities with neither a high prevalence of migration nor a significant out-migrant community (such as Mineral de Pozos).

In total, our data reveal that migrant household heads from the 22 communities remitted home US$ 1.3 million during the 12 months prior to the survey; US$ 748,285 (or 57%) was sent by returned temporary migrants and US$ 553,770 (or 43%) was sent by household heads who were still living abroad at the time of the survey. Paradoxically, the smallest total remitted was in León (US$ 4,648), a large metropolitan area, and the largest amount was in San Diego de Alejandría (US$ 193,767), a small rural town.

Not only household heads send money back to their families, of course; other family members also remit. Considering only remittances by household heads would understate the magnitude of the total capital flow. Table 3 therefore estimates the proportion of non-household heads who remit, the average size of their remittances, and the total amount remitted within each community. Although we did not ask non-household heads directly about money they sent, we are able to estimate their remittance behavior indirectly from questions put to household heads.

Household heads with US experience were asked about amounts remitted during their most recent trip to the United States. That trip could have occurred at any point in their lives, and in fact many household heads reported migrating before they were married with children. We thus estimated a binomial probit model to predict the probability of remitting given a person's age, sex, marital status, occupation, migrant background, period, community, and place of residence. We then computed a Mill's ratio and used it to test whether selection into the sample of remitters affected the size of the remittance itself, and finding no effect, we used these independent variables to predict the size of the remittance using an OLS regression equation with no selectivity correction. Estimates for these prediction equations are presented in Appendices 1 and 2.

We used these equations to predict the remittance behavior of non-household heads by inserting their characteristics into the estimated equations. We thus assume that non-household heads behave as household heads did when they were not yet household heads. As Table 3 indicates, non-household heads in Mexico are generally less likely to remit than household heads (with an average proportion remitting of 0.61 compared to 0.73 for household heads); the amounts remitted were also somewhat less (about US$ 2,100, on average, compared to US$ 2,383 for heads). Among those living in the

*Table 2.* Estimated remittances by household heads into 22 Mexican communities during 12 months prior to the survey (in 1990 US dollars)

| | No. of migrants* | Proportion remitting | Average remittances | Total sample remittances |
|---|---|---|---|---|
| *Community samples* | | | | |
| Guadalajara | 4 | 0.50 | 3,713 | 7,427 |
| León | 13 | 0.46 | 637 | 3,823 |
| Morelia | 9 | 0.56 | 1,297 | 6,486 |
| Irapuato | 4 | 0.75 | 2,883 | 8,650 |
| San Francisco del Rincón | 13 | 0.62 | 3,628 | 29,022 |
| Los Reyes | 17 | 0.82 | 1,628 | 22,792 |
| Ameca | 28 | 0.79 | 2,039 | 44,857 |
| San Felipe Torres Mochas | 30 | 0.70 | 1,274 | 26,749 |
| Ixtlán del Río | 16 | 0.50 | 2,198 | 17,586 |
| Romita | 22 | 0.73 | 2,366 | 37,850 |
| El Salto | 3 | 1.00 | 1,828 | 5,485 |
| Las Varas | 18 | 0.56 | 1,332 | 13,325 |
| Chavinda | 32 | 0.72 | 2,715 | 62,445 |
| Nahuatzen | 13 | 0.92 | 4,167 | 50,001 |
| Ario de Rayón | 30 | 0.90 | 3,107 | 83,896 |
| Amacueca | 16 | 0.82 | 2,207 | 28,691 |
| Unión de San Antonio | 23 | 0.78 | 3,094 | 55,696 |
| San Diego de Alejandría | 60 | 0.88 | 2,003 | 106,185 |
| Santa María del Valle | 20 | 0.65 | 2,115 | 27,494 |
| La Yerbabuena | 39 | 0.56 | 2,769 | 60,921 |
| Mineral de Pozos | 6 | 0.67 | 6,745 | 26,979 |
| La Soledad | 14 | 0.79 | 2,041 | 22,448 |
| Total | 430 | 0.73 | 2,383 | 748,285 |
| *US samples* | | | | |
| Guadalajara | 17 | 0.28 | 3,855 | 18,349 |
| León | 5 | 0.25 | 660 | 825 |
| Morelia | 1 | 0.50 | 1,481 | 741 |
| Irapuato | 1 | 0.20 | 4,052 | 810 |
| San Francisco del Rincón | 42 | 0.45 | 2,878 | 54,394 |
| Los Reyes | 24 | 0.55 | 1,912 | 25,238 |
| Ameca | 38 | 0.20 | 4,052 | 30,795 |
| San Felipe Torres Mochas | 1 | 0.11 | 1,800 | 198 |
| Ixtlán del Río | 73 | 0.44 | 1,904 | 61,156 |
| Romita | 1 | 0.47 | 1,630 | 766 |
| El Salto | 9 | 0.20 | 846 | 1,523 |
| Las Varas | 101 | 0.47 | 2,390 | 113,453 |
| Chavinda | 98 | 0.25 | 2,488 | 60,956 |
| Nahuatzen | 1 | 0.71 | 3,642 | 2,586 |
| Ario de Rayón | 77 | 0.32 | 2,091 | 51,522 |
| Amacueca | 24 | 0.70 | 2,250 | 37,800 |
| Unión de San Antonio | 1 | 0.53 | 4,066 | 2,155 |
| San Diego de Alejandría | 59 | 0.68 | 2,183 | 87,582 |
| Santa María | 1 | 0.50 | 1,105 | 553 |
| La Yerbabuena | 1 | 0.17 | 1,995 | 339 |
| Mineral de Pozos | 1 | 0.40 | 3,955 | 1,582 |
| La Soledad | 1 | 0.10 | 4,472 | 447 |
| Total | 577 | 0.41 | 2,341 | 553,770 |

* US samples weighted to reflect the relative size of the expatriate community.

*Table 3.* Estimated remittances by non-household heads into 22 Mexican communities during the 12 months prior to the survey (in 1990 US dollars)

| | No. of migrants* | Estimated proportion remitting | Estimated average remittances | Total sample remittances |
|---|---|---|---|---|
| *Community samples* | | | | |
| Guadalajara | 5 | 0.63 | 463 | 1,456 |
| León | 17 | 0.25 | 1,482 | 6,300 |
| Morelia | 15 | 0.67 | 1,489 | 15,002 |
| Irapuato | 5 | 0.61 | 3,612 | 10,936 |
| San Francisco del Rincón | 26 | 0.46 | 1,576 | 19,041 |
| Los Reyes | 23 | 0.63 | 1,446 | 20,921 |
| Ameca | 27 | 0.44 | 1,593 | 18,882 |
| San Felipe Torres Mochas | 24 | 0.63 | 1,502 | 22,751 |
| Ixtlán del Río | 10 | 0.51 | 2,315 | 11,736 |
| Romita | 15 | 0.56 | 2,377 | 20,000 |
| El Salto | 1 | 0.69 | 2,798 | 1,941 |
| Las Varas | 47 | 0.43 | 1,608 | 32,368 |
| Chavinda | 37 | 0.72 | 1,758 | 46,539 |
| Nahuatzen | 15 | 0.70 | 2,276 | 23,750 |
| Ario de Rayón | 50 | 0.78 | 2,153 | 83,896 |
| Amacueca | 39 | 0.81 | 2,747 | 86,803 |
| Unión de San Antonio | 12 | 0.80 | 2,585 | 24,777 |
| San Diego de Alejandría | 110 | 0.75 | 2,150 | 178,428 |
| Santa María del Valle | 37 | 0.50 | 1,659 | 31,002 |
| La Yerbabuena | 40 | 0.48 | 2,008 | 38,840 |
| Mineral de Pozos | 12 | 0.52 | 1,721 | 10,723 |
| La Soledad | 15 | 0.76 | 3,438 | 39,279 |
| Total | 582 | 0.61 | 2,100 | 745,370 |
| *US samples* | | | | |
| Guadalajara | 4 | 0.08 | 363 | 116 |
| León | 4 | 0.03 | 1,163 | 140 |
| Morelia | 1 | 0.07 | 1,808 | 127 |
| Irapuato | 1 | 0.10 | 1,472 | 147 |
| San Francisco del Rincón | 237 | 0.07 | 1,704 | 28,269 |
| Los Reyes | 28 | 0.13 | 1,143 | 4,161 |
| Ameca | 51 | 0.06 | 1,465 | 4,483 |
| San Felipe Torres Mochas | 1 | 0.11 | 1,523 | 168 |
| Ixtlán del Río | 36 | 0.06 | 1,732 | 3,741 |
| Romita | 1 | 0.07 | 1,425 | 100 |
| El Salto | 1 | 0.06 | 1,847 | 111 |
| Las Varas | 237 | 0.05 | 1,580 | 18,723 |
| Chavinda | 181 | 0.07 | 1,702 | 21,564 |
| Nahuatzen | 1 | 0.14 | 1,788 | 250 |
| Ario de Rayón | 193 | 0.07 | 1,573 | 21,251 |
| Amacueca | 47 | 0.07 | 1,633 | 5,373 |
| Unión de San Antonio | 1 | 0.08 | 1,777 | 142 |
| San Diego de Alejandría | 325 | 0.12 | 1,630 | 63,570 |
| Santa María del Valle | 2 | 0.06 | 1,821 | 219 |
| La Yerbabuena | 2 | 0.14 | 1,614 | 452 |
| Mineral de Pozos | 1 | 0.06 | 1,841 | 110 |
| La Soledad | 1 | 0.06 | 1,537 | 92 |
| Total | 1,356 | 0.08 | 1,598 | 173,309 |

* US samples weighted to reflect the relative size of the expatriate community.

United States, however, non-heads are markedly less likely to remit than heads, with an average proportion remitting of only 0.08, compared to 0.41 for heads. The amounts remitted are likewise considerably less (US$ 1,598, on average, compared to US$ 2,341 for household heads).

Despite their lower propensity to remit, however, it would still be a mistake to ignore the contributions of non-heads to the transnational capital flow. Non-head members of our 22 samples (wives, daughters, and especially sons) are estimated to have contributed a total of US$ 918,679 to the total remittance flow, with the lion's share (US$ 745,370 or 81%) being contributed by temporary migrants interviewed in Mexico, and the rest (US$ 173,309 or 19%) being sent by expatriates living in the United States.

Table 4 sums the total remittances estimated for heads and non-heads in Mexican and expatriate communities and then divides by the sampling fraction to inflate to the level of the whole community. In the aggregate, we estimate that the 22 communities received some US$ 19 million dollars in remittances during the 12 months prior to the survey. Notably large amounts were remitted to small cities such as Los Reyes and Ixtlán del Río (US$ 2.5 and 2.1 million, respectively). More impressive, however, are the substantial sums flowing into the small towns such as Las Varas, Chavinda, Ario, and San Diego de Alejandría, with populations ranging from 3,516 to 11,541 and capital flows ranging from US$ 1.1 to 2.3 million per year. We return to consider potential local effects once we have estimated the scale of pocket transfers, our next analytic exercise.

**Pocket transfers by US migrants**

When we shift our attention to the money brought back by migrants on return trips to Mexico, the number of communities drops to 18 because the question on pocket transfers was not asked in the first four samples gathered in 1982. We thus lose information from Guadalajara, El Salto, Amacueca, and Chavinda. The amount that each household head reported bringing back to the remaining communities is summarized in Table 5. This table was computed in exactly the same manner as Table 2, but instead of remittances, we employed data on repatriated savings.

In general, migrants were less likely to repatriate earnings through pocket transfers than remittances. Among temporary migrants interviewed in Mexico, an average of only 58% reported returning home with money, compared to 73 percent who said they remitted. Among permanent out-migrants sampled in the United States, pocket transfers were even less likely: only 8 percent reporting carrying money back to Mexico, compared to 41 percent who said they remitted. Not only were the propensities to transfer lower, but the amounts transferred were considerably less than in the case of remittances: heads interviewed in Mexico reported sending an average of US$ 2,383 in remittances, but pocket transfers averaged only US$ 1,392; and

*Table 4.* Estimated total remittances flowing into 22 Mexican communities during the 12 months prior to the survey

| | Mexican sample | | US sample | | Total sample | Inflated to population |
|---|---|---|---|---|---|---|
| | Heads | Non-heads | Heads | Non-heads | | |
| *Metropolitan areas* | | | | | | |
| Guadalajara | 7,427 | 1,456 | 18,349 | 116 | 27,348 | 113,477* |
| León | 3,823 | 6,300 | 825 | 140 | 11,088 | 47,793* |
| Morelia | 6,486 | 15,002 | 741 | 127 | 22,356 | 399,214* |
| Irapuato | 8,650 | 10,936 | 810 | 147 | 20,543 | 205,430* |
| *Small cities* | | | | | | |
| San Francisco | 29,022 | 19,041 | 54,394 | 28,269 | 130,726 | 510,648* |
| Los Reyes | 22,792 | 20,921 | 25,238 | 4,161 | 73,112 | 2,521,103 |
| Ameca | 44,857 | 18,882 | 30,795 | 4,483 | 99,017 | 876,257 |
| San Felipe | 26,749 | 22,751 | 198 | 168 | 49,866 | 940,868 |
| Ixtlán | 17,586 | 11,736 | 61,156 | 3,741 | 94,219 | 2,093,756 |
| Romita | 37,850 | 20,000 | 766 | 100 | 58,716 | 804,329 |
| El Salto | 5,485 | 1,941 | 1,523 | 111 | 9,060 | 86,286 |
| *Towns* | | | | | | |
| Las Varas | 13,325 | 32,368 | 113,453 | 18,723 | 177,869 | 2,403,635 |
| Chavinda | 62,445 | 46,539 | 60,956 | 21,564 | 191,504 | 1,841,385 |
| Nahuatzen | 50,001 | 23,750 | 2,586 | 250 | 76,587 | 550,986 |
| Ario | 83,896 | 83,896 | 51,522 | 21,251 | 240,565 | 1,682,272 |
| Amacueca | 28,691 | 86,803 | 37,800 | 5,373 | 158,667 | 867,033 |
| Unión | 55,696 | 24,777 | 2,155 | 142 | 82,770 | 331,080 |
| San Diego | 106,185 | 178,428 | 87,582 | 63,570 | 435,765 | 1,111,645 |
| *Ranchos* | | | | | | |
| Santa María | 27,494 | 31,002 | 553 | 219 | 59,268 | 158,048 |
| La Yerbabuena | 60,921 | 38,840 | 339 | 452 | 100,552 | 300,155 |
| Pozos | 26,979 | 10,723 | 1,582 | 110 | 39,394 | 65,114 |
| La Soledad | 22,448 | 39,279 | 447 | 92 | 62,266 | 89,079 |
| Total | 748,808 | 745,370 | 553,770 | 173,309 | 2,221,257 | 19,266,064 |

* Inflated to neighborhood population level.

whereas average remittances by US residents were US$ 2,341, their mean pocket transfers were only US$ 1,211.

As a result of both the lower propensity to transfer and the smaller amounts transferred, the total amount of the repatriated savings was less than the total amount of remittances. Migrants interviewed in Mexico reported a total of only US$ 303,485 in pocket transfers compared to US$ 748,285 in remittances; and those interviewed in the United States reported only US$41,550 in pocket transfers compared to US$ 553,770 in remittances.

The funds generated by pocket transfers from non-household heads are even smaller, although still significant in the aggregate. As before, a binomial probit model was used to estimate the likelihood of repatriating savings for non-household heads and a test for sample selectivity was conducted (see Appendix 3). An OLS regression equation with no selectivity correction was

*Table 5.* Estimated savings brought back into 18 Mexican communities by household heads upon return or visit (in 1990 US dollars)

| | No. of migrants* | Proportion saving | Average savings | Total sample savings |
|---|---|---|---|---|
| *Community samples* | | | | |
| León | 13 | 0.46 | 311 | 1,864 |
| Morelia | 9 | 0.33 | 1,407 | 4,222 |
| Irapuato | 4 | 0.25 | 960 | 960 |
| San Francisco del Rincón | 13 | 0.31 | 1,379 | 5,518 |
| Los Reyes | 17 | 0.76 | 1,250 | 16,255 |
| Ameca | 28 | 0.71 | 1,406 | 28,124 |
| San Felipe Torres Mochas | 30 | 0.63 | 1,300 | 24,701 |
| Ixtlán del Río | 16 | 0.44 | 918 | 6,426 |
| Romita | 23 | 0.43 | 1,435 | 14,348 |
| Las Varas | 18 | 0.67 | 966 | 11,594 |
| Nahuatzen | 13 | 0.62 | 2,742 | 21,937 |
| Ario de Rayón | 30 | 0.67 | 1,449 | 28,985 |
| Unión de San Antonio | 23 | 0.57 | 2,411 | 31,346 |
| San Diego | 60 | 0.58 | 1,348 | 47,177 |
| Santa María | 20 | 0.45 | 488 | 4,388 |
| La Yerbabuena | 39 | 0.67 | 1,604 | 41,700 |
| Mineral de Pozos | 6 | 0.50 | 534 | 1,602 |
| La Soledad | 14 | 0.64 | 1,371 | 12,339 |
| Total | 376 | 0.58 | 1,392 | 303,485 |
| *US samples* | | | | |
| León | 5 | 0.06 | 288 | 86 |
| Morelia | 1 | 0.00 | 0 | 0 |
| Irapuato | 1 | 0.00 | 0 | 0 |
| San Francisco del Rincón | 42 | 0.25 | 890 | 9,345 |
| Los Reyes | 24 | 0.05 | 500 | 600 |
| Ameca | 38 | 0.35 | 1,778 | 23,647 |
| San Felipe Torres Mochas | 1 | 0.00 | 0 | 0 |
| Ixtlán del Río | 73 | 0.00 | 0 | 0 |
| Romita | 1 | 0.00 | 0 | 0 |
| Las Varas | 101 | 0.06 | 672 | 4,072 |
| Nahuatzen | 1 | 0.18 | 1,663 | 299 |
| Ario de Rayón | 77 | 0.05 | 900 | 3,465 |
| Unión de San Antonio | 1 | 0.00 | 0 | 0 |
| San Diego | 59 | 0.00 | 0 | 0 |
| Santa María | 1 | 0.00 | 0 | 0 |
| La Yerbabuena | 1 | 0.06 | 600 | 36 |
| Mineral de Pozos | 1 | 0.00 | 0 | 0 |
| La Soledad | 1 | 0.00 | 0 | 0 |
| Total | 429 | 0.08 | 1,211 | 41,550 |

* US samples weighted to reflect the relative size of the expatriate community.

*Table 6.* Estimated savings brought into 18 Mexican communities by non-household heads during the 12 months prior to the survey (in 1990 US dollars)

| | No. of migrants* | Estimated proportion saving | Estimated average savings | Total sample savings |
|---|---|---|---|---|
| *Community samples* | | | | |
| León | 17 | 0.27 | 447 | 2,025 |
| Morelia | 15 | 0.70 | 801 | 8,392 |
| Irapuato | 5 | 0.39 | 305 | 600 |
| San Francisco del Rincón | 26 | 0.51 | 969 | 12,935 |
| Los Reyes | 23 | 0.71 | 934 | 15,225 |
| Ameca | 27 | 0.49 | 922 | 12,314 |
| San Felipe Torres Mochas | 24 | 0.68 | 605 | 9,823 |
| Ixtlán del Río | 10 | 0.49 | 1,130 | 5,534 |
| Romita | 15 | 0.45 | 633 | 4,275 |
| Las Varas | 47 | 0.69 | 806 | 25,991 |
| Nahuatzen | 15 | 0.50 | 411 | 3,099 |
| Ario de Rayón | 50 | 0.66 | 774 | 25,646 |
| Unión de San Antonio | 12 | 0.54 | 883 | 5,684 |
| San Diego | 110 | 0.66 | 967 | 69,804 |
| Santa María | 37 | 0.58 | 469 | 10,086 |
| La Yerbabuena | 40 | 0.67 | 923 | 24,863 |
| Mineral de Pozos | 12 | 0.63 | 679 | 5,170 |
| La Soledad | 15 | 0.75 | 660 | 7,399 |
| Total | 500 | 0.58 | 858 | 248,865 |
| *US samples* | | | | |
| León | 4 | 0.01 | 167 | 7 |
| Morelia | 1 | 0.01 | 230 | 2 |
| Irapuato | 1 | 0.02 | 477 | 10 |
| San Francisco del Rincón | 237 | 0.01 | 142 | 337 |
| Los Reyes | 28 | 0.02 | 507 | 284 |
| Ameca | 51 | 0.01 | 173 | 88 |
| San Felipe Torres Mochas | 1 | 0.02 | 649 | 13 |
| Ixtlán del Río | 36 | 0.01 | 414 | 149 |
| Romita | 1 | 0.01 | 204 | 2 |
| Las Varas | 237 | 0.01 | 179 | 424 |
| Nahuatzen | 1 | 0.03 | 438 | 13 |
| Ario de Rayón | 193 | 0.01 | 218 | 420 |
| Unión de San Antonio | 1 | 0.01 | 92 | 1 |
| San Diego | 325 | 0.02 | 810 | 5,265 |
| Santa María | 2 | 0.01 | 56 | 1 |
| La Yerbabuena | 2 | 0.03 | 670 | 40 |
| Mineral de Pozos | 1 | 0.00 | 33 | 0 |
| La Soledad | 1 | 0.01 | 145 | 1 |
| Total | 1,123 | 0.01 | 628 | 7,057 |

* US samples weighted to reflect the relative size of the expatriate community.

then used to predict the amount of the transfer (Appendix 2). The resulting estimates of pocket transfers by non-heads are shown in Table 6.

Although non-household heads interviewed in Mexico had roughly the same probability of repatriating savings as heads (0.58, on average), the amounts transferred were considerably less – averaging only US$ 858 compared to US$ 1,392 for household heads. Non-heads interviewed in the United States had very low probabilities of repatriating savings, however (only 0.01 on average); and very small amounts were transferred (averaging only US$ 628). As a result, only US$ 255,922 flowed into the 18 communities as a result of pocket transfers from non-household heads working in the United States (compared to US$ 801,315 in remittances for non-heads in the same communities).

Table 7 combines estimates of pocket transfers for heads and non-heads sampled in Mexico and the United States to generate a total sample figure, which is then inflated to the population level by dividing by the sampling fraction. In all, we estimate that the communities received some 5.1 million in repatriated savings during the 12 months prior to the survey. The aggregate flow of pocket transfers was particularly large in the cities of Los Reyes, Ameca, and San Felipe Torres Mochas, but it was also sizeable in smaller towns such as Las Varas, Ario de Rayón, and San Diego de Alejandría.

**Migradollars in comparative perspective**

In Table 8 we combine the aggregate estimates of remittances and pocket transfers just developed (in the last columns of Tables 4 and 7) to yield a grand total of migradollars for each community. In order to judge the relative importance of these funds in the local economy, we compare them to the population size and to the aggregate income earned within the community, calculated from 1990 Mexican census data.

According to our results, 24.4 million dollars in US funds flowed into 22 communities whose collective population was only 226,000, yielding a figure of US$ 108 migradollars per capita. That is, for every man, woman, and child living in the sample communities during the survey year, US$ 108 dollars was received from migrants in the United States. When US funds are compared to locally earned income, moreover, the ratio of 21 percent confirms that US migration is a cornerstone of western Mexico's economy. This ratio implies that for every dollar's worth of pesos earned locally, 21 US$cents enter the community from abroad.

The aggregate capital flow exceeded US$ 1 million in nine cases (Los Reyes, Ameca, San Felipe, Ixtlán, Romita, Las Varas, Chavinda, Ario, and San Diego); and in absolute terms the range extends from just US$ 66,000 in León to US$ 3.6 million in Los Reyes. All of the small cities had flows exceeding US$ 1 million except San Francisco del Rincón, where only one neighborhood was sampled and the total was only US$ 620,550. If other

*Table 7.* Estimated total savings brought back to 18 Mexican communities during the 12 months prior to the survey (1990 US dollars)

| Community | Mexican sample | | US sample | | Total sample | Inflated to population |
|---|---|---|---|---|---|---|
| | Heads | Non-heads | Heads | Non-heads | | |
| *Metropolitan areas* | | | | | | |
| León | 1,864 | 2,025 | 86 | 7 | 3,982 | 17,164* |
| Morelia | 4,222 | 8,392 | 0 | 2 | 12,616 | 225,286* |
| Irapuato | 960 | 600 | 0 | 10 | 1,570 | 15,700* |
| *Small cities* | | | | | | |
| San Francisco | 5,518 | 12,935 | 9,345 | 337 | 28,135 | 109,902* |
| Los Reyes | 16,255 | 15,225 | 600 | 284 | 32,364 | 1,116,000 |
| Ameca | 28,124 | 12,314 | 23,647 | 88 | 64,173 | 567,903 |
| San Felipe | 24,701 | 9,823 | 0 | 13 | 34,537 | 651,642 |
| Ixtlán | 6,426 | 5,534 | 0 | 149 | 12,109 | 269,089 |
| Romita | 14,348 | 4,275 | 0 | 2 | 18,625 | 255,137 |
| *Towns* | | | | | | |
| Las Varas | 11,594 | 25,991 | 4,072 | 424 | 42,081 | 568,622 |
| Nahuatzen | 21,937 | 3,099 | 299 | 13 | 25,348 | 182,360 |
| Ario | 28,985 | 25,646 | 3,465 | 420 | 58,516 | 409,203 |
| Unión | 31,346 | 5,684 | 0 | 1 | 37,031 | 148,124 |
| San Diego | 47,177 | 69,804 | 0 | 5,265 | 122,246 | 311,852 |
| *Ranchos* | | | | | | |
| Santa María | 4,388 | 10,086 | 0 | 1 | 14,475 | 38,600 |
| La Yerbabuena | 41,700 | 24,863 | 36 | 40 | 66,639 | 198,922 |
| Pozos | 1,602 | 5,170 | 0 | 0 | 6,772 | 11,193 |
| La Soledad | 12,339 | 7,399 | 0 | 1 | 19,739 | 28,239 |
| Total | 303,485 | 248,865 | 41,440 | 7,057 | 600,847 | 5,124,938 |

* Inflated to neighborhood population level.

neighborhoods remitted at the same rate the one we sampled, the total for entire city would be US$ 6.2 million. Although the total may not be quite this large, it is clearly well into the millions.

The relatively large sums entering small cities from the United States reflects the relative prevalence of migration in these places, of course, but also their relatively large size. In a large city, even a low prevalence will produce large absolute numbers of migrants transferring capital and, hence, relatively large flows. More impressive are the very substantial sums entering much smaller towns such as Las Varas, Chavinda, Ario de Rayón, and San Diego de Alejandria, where the populations range from 3,500 to 11,500. In these places, large capital flows stem from very high migratory prevalences and relatively large communities of settled out-migrants, not from the large size of the settlements per se. Among the communities just mentioned, the capital flow ranged from US$ 1.4 million in San Diego de Alejandría to nearly US$ 3 million in Las Varas.

Considering migradollars per capita or as a percentage of locally earned income reveals a curvilinear pattern with respect to community size. In

*Table 8.* Total flow of capital into 22 Mexican communities from migrants working in the United States during 12 months prior to survey (1990 US dollars)

| Community | Total remittances | Total savings | Grand total | Size of population | Migradollars | |
|---|---|---|---|---|---|---|
| | | | | | Per capita | As a % of local income |
| *Metropolitan areas* | | | | | | |
| Guadalajara | 113,477 | – | 113,477 | 5,145* | 22 | 2.3 |
| León | 47,793 | 17,164 | 64,957 | 5,621* | 12 | 1.4 |
| Morelia | 399,214 | 225,286 | 624,500 | 15,982* | 39 | 6.0 |
| Irapuato | 205,430 | 15,700 | 221,130 | 8,270* | 27 | 4.7 |
| *Small cities* | | | | | | |
| San Francisco | 510,648 | 109,902 | 620,550 | 5,258* | 118 | 19.8 |
| Los Reyes | 2,521,103 | 1,116,000 | 3,637,103 | 32,474 | 112 | 21.4 |
| Ameca | 876,257 | 567,903 | 1,444,160 | 30,882 | 47 | 9.6 |
| San Felipe | 940,868 | 651,642 | 1,592,510 | 20,614 | 77 | 30.6 |
| Ixtlán | 2,093,756 | 269,089 | 2,362,845 | 19,645 | 120 | 22.5 |
| Romita | 804,329 | 255,137 | 1,059,466 | 16,535 | 64 | 24.2 |
| El Salto | 86,286 | – | 86,286 | 11,546 | 7 | 1.3 |
| *Towns* | | | | | | |
| Las Varas | 2,403,635 | 568,622 | 2,972,257 | 11,541 | 258 | 46.4 |
| Chavinda | 1,841,385 | – | 1,841,385 | 7,437 | 247 | 110.8 |
| Nahuatzen | 550,986 | 182,360 | 733,346 | 7,025 | 104 | 32.5 |
| Ario | 1,682,272 | 409,203 | 2,091,475 | 6,429 | 325 | 53.3 |
| Amacueca | 867,033 | – | 867,033 | 5,006 | 173 | 59.2 |
| Unión | 331,080 | 148,124 | 479,204 | 4,760 | 101 | 29.8 |
| San Diego | 1,111,645 | 311,852 | 1,423,497 | 3,516 | 405 | 94.8 |
| *Ranchos* | | | | | | |
| Santa María | 158,048 | 38,600 | 196,648 | 3,098 | 63 | 12.1 |
| La Yerbabuena | 300,155 | 198,922 | 499,077 | 2,240 | 222 | 40.3 |
| Pozos | 65,114 | 11,193 | 76,307 | 1,737 | 44 | 13.4 |
| La Soledad | 89,079 | 28,239 | 117,318 | 1,080 | 109 | 18.9 |
| Total | 19,266,064 | 5,124,938 | 24,391,002 | 225,841 | 108 | 21.7 |

* Population of sample neighborhood only.

large metropolitan areas, migradollars average only US$ 25 per capita and represent only 3.6 percent of locally earned income. In small cities, per capita migradollars rise to US$ 78 and represent 18.5 percent of local income. The figures rise to a peak in small towns, where per capita transfers average of US$ 230 and comprise 61.0 percent of local income (that is, for every dollar's worth of income earned locally 61 cents enter from the United States). Finally, in the smallest ranchos the per capita flow of US dollars, although still substantial, drops to US$ 109, representing 21 percent of local income.

por eso gente que aunque este especializada en ganadería o agricultura, trabajan en la zona metropolitana

This decline in the smallest size category seems to occur because ranchos are too small to support large out-migrant communities, not because migration is necessarily less extensive. In the hamlet of La Yerbabuena, (population 2,240), for example, virtually all households contain someone with US migratory experience and two thirds of adult males are active US migrants (Reichert & Massey 1979). But this town has no out-migrant community to

speak of: instead migrants shuttle back and forth across the border for seasonal agricultural work.

In contrast, places such as Las Varas, Chavinda, Ario, and San Diego are large enough to support sizeable branch communities in US towns and cities, and transfers from US residents contribute to a highly dollarized local economy. In San Diego de Alejandría, for example, we estimate that US$ 1.4 million annually flows into a population of only 3,516 people, representing $405 for each man, woman, and child. In this community, migradollars nearly equal local income: for every dollar's worth of pesos earned locally, 95 cents enter from the United States. Ario de Rayón also displays a heavily dollarized economy: the per capita flow is US$ 325 and for every dollar's worth of income earned there, 53 cents arrive from abroad.

In many ways, San Diego de Alejandría is the epitome of the binational migrant community. Three quarters of all adult men in the Mexican sample have been to the United States; half have been within the past three years; and 96 percent of all households contain a current or former US migrant. Moreover, for every 100 households living in San Diego itself, some 30 live in branch communities north of the border. The current mayor is an ex-migrant with more than 20 years of US experience, and his son is an American citizen serving in armed forces of the United States. Recently, the town came to the attention of producers at the Public Broadcasting System and became the subject of a profile on the McNeil–Leher Report.

The economy with the most extreme case of dollarization, however, is that of Chavinda, Michoacán. Not only does it have a high prevalence of migration within the community (two-thirds of adult males have been abroad and 85 percent of the households contain a current or former migrant); it also has an unusually large out-migrant community (about half the size of the home community) and relatively low local incomes (the equivalent of about US$ 223 per capita). In this community, the total flow of US dollars is more than 258 per capita and migradollars actually exceed locally earned income. For every dollar's worth of income earned in Chavinda, US$ 1.11 enters from the United States.

In other words, more US dollars circulate in Chavinda's economy than the dollar equivalent in pesos. This finding is even more dramatic when we consider that our estimate of the total capital flow necessarily understates the actual amount, since it does not include pocket remittances owing to the absence of the appropriate question in surveys of the first four communities. If savings were proportionate to remittances, however, the total inflow of dollars into Chavinda would be in the neighborhood of US$ 2.3 million for a population of only 7,437, yielding a per capita figure of US$ 313 and a ratio to local income of 140.6. Thus, for every dollar's worth of pesos earned in this community, probably US$ 1.41 enters from the United States.

In general terms, our findings compare favorably with those developed by Lozano Ascencio (1993). He estimated that 71 percent of the total flow came from remittances and 29 percent from pocket transfers; our figures are 79

percent and 21 percent respectively. Likewise, he calculated that 58 percent of the total flow into Mexico was attributable to temporary migrants and 42 percent to permanent residents; our figures are a little higher at 70 and 30% (tabulations not shown). In this regard, our figures are closer to Nolasco (1991), who estimated that 67 percent of the flow came from temporary migrants and 33 percent from permanent settlers.

There are several possible ways to extrapolate our findings to the regional and national levels for a more specific comparison with the estimates of Lozano Ascencio and others. If we assume that our samples are roughly representative of conditions in Western Mexico, then multiplying the base population of the four states (13.658 million) by our figure of US$ 108 migradollars per capita yields an estimate of US$ 1.5 billion dollars flowing into the region circa 1988 (the mean year of our samples is 1988, so we consider this the base year).

Since the states of Western Mexico have a higher prevalence of migration than other regions of Mexico, however, we cannot simply multiply our per capita figure by Mexico's total population to generate an estimate for the nation as a whole. We can, however, insert parameters estimated from our sample into formulas developed by Lozano Ascencio. His estimates of probabilities and amounts transferred were based on a small number of communities with small sample sizes; and he did not explicitly control for the fact that many of those working abroad are not household heads, and therefore display a lower propensity to remit or return with funds in their pockets.

Lozano Ascencio estimated that remittances from temporary migrants abroad totalled US$ 928 million in 1990, a figure he derived by multiplying an estimated number of temporary migrants (396,000) by an empirically derived probability of remitting of 0.69 and an average yearly remittance of US$ 3,396. If we accept his number of temporary migrants and apply our own estimates of the proportion remitting (0.66, computed as a weighted average of heads and non-heads interviewed in Mexico) and the average yearly remittance (US$ 2,220, again computed as a weighted average of heads and non-heads in the Mexican samples), we obtain the somewhat lower figure of US$ 580.2 million The smaller size reflects our estimate of the lower propensity of non-heads to remit, yielding lower overall remittance probabilities and smaller average remittances.

A second component of Lozano Ascencio's estimate consisted of pocket transfers by temporary migrants who returned home. He estimated the number of returning migrants at 795,000 in 1990, and their propensity to remit at 0.64. Multiplying these two figures by an empirically-derived average transfer of US$ 1,798 yielded a total pocket transfer of US$ 915 million. When we substitute our estimates of the proportion returning with savings (0.58) and the average amount transferred (US$ 1,087), we obtain a figure of US$ 501.2 million, with the smaller size again reflecting our estimate of the lower propensity of non-heads to transfer funds.

Finally, the third component of Lozano Ascencio's estimate was remittances by settled workers in the United States. From various sources he estimated the number of settled migrants at 2,640,000, with an overall propensity to remit of 0.32 (a labor force participation rate of 0.64 times a propensity for workers to remit of 0.50) and an average remittance of US$ 1,548. The product of these terms gives his estimate of total resident remittances: US$ 1.308 million. As before, our estimate is lower because we estimate the probability of remitting only at only 0.18 (computed as a weighted average of heads and non-heads interviewed in the United States), even though we show the average size of remittances to be slightly higher at US$ 1,820 (again computed as a weighted average). Keeping his estimate of the stock of resident migrants and applying our estimated probabilities and amounts yields a figure of US$ 864,864.

To this point, Lozano Ascencio's estimates for the various components of the capital flow sum to US$ 3.15 billion whereas the components derived from our re-analysis sum to US$ 1.95 billion, a figure closer to those developed by the Banco de México (US$ 1.98 billion), Nolasco (US$ 1.8 billion), García y Griego & Giner de los Ríos (US$ 1.8 billion), and Keely & Tran (US$ 2.3 billion).

There is, however, one additional component not included in the Lozano Ascencio model: pocket transfers by US residents. Although migrants may be settled permanently in the United States, they still return to visit from time to time, often bringing with them significant amounts of cash. If we accept Lozano Ascencio's estimate of the stock of US settlers and apply our own estimates of the propensity to engage in pocket transfers (0.03, computed as a weighted average of heads and non-heads in the sample) together with our estimate of the average size of the transfer (US$ 789, computed as a similar weighted average), we obtain an additional US$ 62.5 million, bringing the total capital flow to US$ 2.01 billion circa 1988.

## Conclusion: The potential for development

In summary, as best we can determine from our data, the flow of migradollars into Mexico totalled some US$ 2 billion in the late 1980s, a figure that corresponds closely with earlier estimates developed by a variety of investigators, but somewhat smaller than the figure derived most recently by Lozano Ascencio. About US$ 1.5 billion, or roughly three quarters of the total, flowed into western Mexico, the primary source of migrants to the United States.

By any measure, the potential economic effect of migradollars on the Mexican economy must be enormous. At US$ 2 billion, migradollars would constitute 90 percent Mexico's earnings from agricultural exports, 78 percent of its direct foreign investment, 59 percent of its earnings from tourism, and 56 percent of its earnings from the maquila industry (based on 1990 figures

*Table 9.* Estimated amount of remittances and savings spent on production and consumption

| Spending category | Remittances (in US$) | Savings (in US$) | Total amount (in US$) | Percentage |
|---|---|---|---|---|
| Production | 721,044 | 872,720 | 1,593,764 | 6.5 |
| Farmland | 58,552 | 11,734 | 70,286 | 0.3 |
| Livestock | 41,021 | 59,866 | 100,887 | 0.4 |
| Business | 461,314 | 564,716 | 1,026,030 | 4.2 |
| Tools | 0 | 10,358 | 10,358 | 0.0 |
| Saved | 160,157 | 226,046 | 386,203 | 1.6 |
| Consumption | 12,525,078 | 3,400,810 | 15,925,888 | 65.3 |
| Housing | 1,582,061 | 906,995 | 2,489,056 | 10.2 |
| Consumer goods | 843,081 | 365,760 | 1,208,841 | 5.0 |
| Recreation | 198,560 | 417,800 | 616,360 | 2.5 |
| Family maintenance | 9,901,376 | 1,710,255 | 11,611,631 | 47.6 |
| Ambiguous | 2,630,053 | 833,911 | 3,463,964 | 14.2 |
| Debts | 831,601 | 151,275 | 982,876 | 4.0 |
| Motor vehicles | 0 | 19,044 | 19,044 | 0.1 |
| Other | 1,798,452 | 663,592 | 2,462,044 | 10.1 |
| Unknown | 3,389,889 | 17,497 | 3,407,386 | 14.0 |
| Total | 19,266,064 | 5,124,938 | 24,391,002 | 100.0 |

taken from Lozano Ascencio, 1993). Although the economic effect of migradollars is clearly substantial, however, the precise nature of that influence depends on how the dollars are spent.

Table 9 shows the distribution of migradollars by spending category, as reported by migrants in our sample. When migrants reported multiple spending categories, funds were divided equally between them. We coded up to five kinds of spending per person. If a migrant reported remitting US$ 1,000 and spending it in five categories, therefore, each spending class was allocated US$ 200. To some degree, this procedure probably understates the amounts allocated to the first-mentioned spending category and overstates the last-mentioned category.

Of the total flow of migradollars into our 22 sample communities, nearly two-thirds (65%) went to current consumption. Only 6.5 percent was spent on productive enterprises; 14 percent went into spending categories that could not be classified clearly as either production or consumption; and another 14 percent went to unknown ends. By far the most important target of migradollars was family maintenance, which includes spending on food, clothing, and health, among other things. According to our data, nearly half (48%) of all migradollars entering Mexico were spent on family maintenance, with the next largest category being housing (constituting about 10% of the flow). There was, however, a greater tendency to spend *savings* on productive ends compared to *remittances*: whereas 17 percent of savings went to production, only 3.7 percent of remittances did so. Because remittances

constitute nearly 80 percent of the total capital flow, however, only 6.5 percent of all migradollars ended up being spent on productive ends.

Of the migradollars going into production, the largest share was invested in business enterprises. Across the 22 communities, more than US$ 1 million migradollars went into entrepreneurial activities as a result of US migration. Although small in comparison with the total flow this investment nonetheless constitutes a significant infusion of capital for many small business owners, and its importance in entrepreneurial efforts should not be underestimated (Durand & Massey 1992). If we apply the distribution shown in Table 9 to the US$ 2 billion in migradollars calculated for the nation as a whole, we estimate that some US$ 84 million per year was being invested directly in business activities during the late 1980s as a result of migration to the United States.

The direct effect of migradollars on Mexican economic activities, however, is likely to be small compared to the indirect effects, which stem from the demand for goods and services generated by Mexicans possessing dollars sent or brought from abroad. According to our estimates, in the neighborhood US$ 1.3 billion in additional demand was created in Mexico by migration to the United States (0.653 × US$ 2 billion).

Whether the effects are direct or indirect, however, this exercise has clearly shown that migradollars constitute a potent influence on the Mexican economy, representing one of the country's largest sources of foreign exchange and an important source of its investment capital. Moreover, unlike money generated by agricultural exports, oil, tourism, international lending, or direct foreign investment, the vast majority of migradollars go directly to people concentrated at the lower end of Mexico's income distribution. In this sense, US acceptance of large numbers of Mexican immigrants and the tolerance of substantial undocumented migration represents a form of foreign aid that is probably more cost-effective than all of the official development programs combined, since these funds are generally filtered through international and domestic bureaucracies and, hence, into the pockets of well-educated, middle class bureaucrats.

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## Appendices

*Appendix 1.* Binomial probit and regression estimates of probability of remitting and the amount of the remittance (logged): household heads in 22 Mexican communities

| | Probability of remitting | | Amount of remittance | |
|---|---|---|---|---|
| | B | SE | B | SE |
| *Demographic background* | | | | |
| Age | 0.009 | 0.016 | 0.005 | 0.017 |
| Age squared | −0.000 | 0.001 | −0.000 | 0.000 |
| Male | 0.535** | 0.187 | 0.930* | 0.405 |
| Unmarried | −0.267** | 0.092 | −0.127 | 0.175 |
| *Occupation* | | | | |
| Not working | – | – | | |
| Skilled | 0.829** | 0.178 | 0.337 | 0.588 |
| Unskilled | 0.957** | 0.163 | 0.414 | 0.648 |
| Agricultural | 0.828** | 0.166 | 0.293 | 0.582 |
| *Migrant background* | | | | |
| No. of prior trips | −0.007 | 0.007 | 0.017* | 0.008 |
| Trip duration | −0.001 | 0.001 | −0.000 | 0.000 |
| U.S. sample | −0.497** | 0.201 | −0.390 | 0.378 |
| *Period* | | | | |
| Before 1980 | – | – | | |
| 1980 or later | 0.316** | 0.096 | −0.300 | 0.188 |
| *Community* | | | | |
| San Francisco del R. | – | – | – | – |
| León | −0.357 | 0.292 | −0.393 | 0.409 |
| San Diego de A. | 0.714** | 0.228 | 0.678 | 0.413 |
| Romita | 0.137 | 0.274 | 0.253 | 0.276 |
| Mineral de Pozos | −0.107 | 0.349 | 0.340 | 0.355 |
| Unión de S.A. | 0.741** | 0.256 | 0.567 | 0.439 |
| S. María del V. | 0.004 | 0.239 | 0.171 | 0.237 |
| Ario de Rayón | 0.867** | 0.232 | 0.589 | 0.475 |
| Los Reyes | 0.293 | 0.238 | 0.311 | 0.281 |
| La Yerbabuena | −0.090 | 0.231 | 0.474* | 0.235 |
| Ixtlán del Río | 0.299 | 0.243 | 0.465 | 0.290 |
| Las Varas | 0.011 | 0.248 | 0.222 | 0.246 |
| San Felipe T.M. | 0.234 | 0.230 | 0.067 | 0.260 |
| Nahuatzen | 0.518 | 0.316 | 0.491 | 0.385 |
| Irapuato | 0.132 | 0.354 | 0.747* | 0.354 |
| La Soledad | 0.671* | 0.316 | 1.020* | 0.459 |
| Ameca | 0.246 | 0.238 | 0.326 | 0.268 |
| Morelia | 0.398 | 0.275 | 0.325 | 0.333 |
| Amacueca | 0.924* | 0.440 | 0.900 | 0.614 |
| Tepec | 0.657 | 0.395 | 0.780 | 0.482 |
| Chavinda | 0.886** | 0.283 | 0.457 | 0.509 |
| El Salto | 0.176 | 0.341 | 0.292 | 0.356 |
| Guadalajara | 0.171 | 0.469 | −1.383** | 0.477 |

*Appendix 1.* Continued

| | Probability of remitting | | Amount of remittance | |
|---|---|---|---|---|
| | B | SE | B | SE |
| *Selection correction* | | | | |
| Lamda | – | – | 0.741 | 1.041 |
| *Constant* | −1.463** | 0.475 | 3.768* | 1.837 |
| *Goodness of fit* | | | | |
| $R^2$ (Adjusted) | – | | 0.092* | |
| Log likelihood | | | | |
| Full model | −901.28 | | – | |
| Intercept only | −1031.0 | | – | |
| Chi-squared | 259.47** | | – | |
| Number of cases | 1,535 | | 926 | |

* $p < 0.05$; ** $p < 0.01$

*Appendix 2.* OLS regression estimates of logged remittances and logged savings: household heads in 22 Mexican communities

| | Amount of remittances | | Amount of savings | |
|---|---|---|---|---|
| | B | SE | B | SE |
| *Demographic background* | | | | |
| Age | 0.001 | 0.015 | 0.015 | 0.023 |
| Age squared | −0.000 | 0.000 | −0.000 | 0.000 |
| Male | 0.688** | 0.208 | −0.056 | 0.339 |
| Unmarried | −0.022 | 0.087 | 0.108 | 0.150 |
| *Occupation* | | | | |
| Not working | – | – | – | – |
| Skilled | −0.052 | 0.203 | 0.862** | 0.322 |
| Unskilled | −0.023 | 0.192 | 0.707* | 0.300 |
| Agricultural | −0.095 | 0.193 | 0.433 | 0.299 |
| *Migrant background* | | | | |
| No. of prior trips | 0.020** | 0.006 | 0.031** | 0.009 |
| Trip duration | 0.000 | 0.000 | 0.006** | 0.002 |
| U.S. sample | −0.163 | 0.190 | −0.089 | 0.362 |
| *Period* | | | | |
| Before 1980 | – | – | – | – |
| 1980 or later | −0.417** | 0.084 | −0.515** | 0.134 |
| *Community* | | | | |
| San Francisco del R. | – | – | – | – |
| León | −0.215 | 0.311 | −0.879* | 0.449 |
| San Diego de A. | 0.424* | 0.193 | 0.090 | 0.271 |
| Romita | 0.192 | 0.245 | −0.372 | 0.375 |
| Mineral de Pozos | 0.381 | 0.331 | −0.108 | 0.441 |
| Unión de S.A. | 0.299 | 0.208 | −0.200 | 0.317 |
| S. María del V. | 0.169 | 0.224 | −0.613* | 0.305 |
| Ario de Rayón | 0.285 | 0.192 | −0.227 | 0.272 |
| Los Reyes | 0.194 | 0.214 | 0.036 | 0.292 |
| La Yerbabuena | 0.516* | 0.214 | 0.230 | 0.293 |

*Appendix 2.* Continued

| | Amount of remittances | | Amount of savings | |
|---|---|---|---|---|
| | B | SE | B | SE |
| Ixtlán del Río | 0.345 | 0.221 | 0.212 | 0.311 |
| Las Varas | 0.214 | 0.232 | 0.083 | 0.299 |
| San Felipe T.M. | −0.030 | 0.208 | −0.498 | 0.287 |
| Nahuatzen | 0.300 | 0.255 | −0.784* | 0.406 |
| Irapuato | 0.690* | 0.324 | −0.991 | 0.568 |
| La Soledad | 0.763** | 0.259 | −0.211 | 0.376 |
| Ameca | 0.225 | 0.213 | 0.037 | 0.292 |
| Morelia | 0.171 | 0.237 | −0.056 | 0.332 |
| Amacueca | 0.540 | 0.335 | – | – |
| Tepec | 0.535 | 0.309 | – | – |
| Chavinda | 0.137 | 0.222 | – | – |
| El Salto | 0.231 | 0.327 | – | – |
| Guadalajara | −1.501** | 0.443 | – | – |
| *Constant* | 5.022** | 0.467 | 6.170** | 0.746 |
| $R^2$ (adjusted) | 0.093** | | 0.087 | |
| Number of cases | 926 | | 707 | |

* $p < 0.05$; ** $p < 0.01$

*Appendix 3.* Binomial probit and regression estimates of probability of saving and the amount of the reported savings (logged): household heads in 22 Mexican communities

| | Probability of saving | | Amount of savings | |
|---|---|---|---|---|
| | B | SE | B | SE |
| *Demographic background* | | | | |
| Age | −0.009 | 0.017 | 0.047 | 0.100 |
| Age squared | 0.000 | 0.000 | −0.000 | 0.001 |
| Male | 0.636** | 0.219 | −2.871 | 2.567 |
| Unmarried | −0.119 | 0.111 | 0.585 | 0.733 |
| *Occupation* | | | | |
| Not working | – | – | – | – |
| Skilled | 0.951** | 0.204 | −3.706 | 3.708 |
| Unskilled | 0.929** | 0.182 | −3.753 | 3.593 |
| Agricultural | 0.893** | 0.183 | −3.892 | 3.496 |
| *Migrant background* | | | | |
| No. prior trips | 0.006 | 0.007 | 0.008 | 0.043 |
| Trip duration | −0.002* | 0.001 | 0.016 | 0.010 |
| U.S. sample | −1.781** | 0.219 | 9.470 | 7.350 |
| *Period* | | | | |
| Before 1980 | – | – | – | – |
| 1980 or later | 0.178 | 0.106 | −1.227 | 0.797 |
| *Community* | | | | |
| San Francisco del R. | – | – | – | – |
| León | −0.425 | 0.292 | 1.298 | 2.470 |
| San Diego de A. | 0.250 | 0.219 | −0.915 | 1.432 |
| Romita | −0.299 | 0.269 | 0.991 | 1.917 |

*Appendix 3.* Continued

| | Probability of saving | | Amount of savings | |
|---|---|---|---|---|
| | B | SE | B | SE |
| Mineral de Pozos | 0.513 | 0.353 | −0.332 | 1.967 |
| Unión de S.A. | −0.171 | 0.239 | 0.515 | 1.490 |
| S. María del V. | 0.013 | 0.240 | −0.687 | 1.358 |
| Ario de Rayón | 0.351 | 0.221 | −1.600 | 1.601 |
| Los Reyes | 0.334 | 0.241 | −1.269 | 1.639 |
| La Yerbabuena | 0.104 | 0.237 | −0.224 | 1.356 |
| Ixtlán del Río | 0.145 | 0.244 | −0.399 | 1.451 |
| Las Varas | 0.600** | 0.262 | −2.151 | 2.148 |
| San Felipe T.M. | 0.151 | 0.233 | −1.123 | 1.370 |
| Nahuatzen | −0.322 | 0.295 | 0.634 | 2.062 |
| Irapuato | −0.669 | 0.360 | 2.248 | 3.377 |
| La Soledad | 0.411 | 0.318 | −1.814 | 2.080 |
| Ameca | 0.297 | 0.240 | −1.138 | 1.573 |
| Morelia | 0.247 | 0.273 | −1.049 | 1.665 |
| *Selection correction* | | | | |
| Lamda | – | – | 7.451 | 5.616 |
| *Constant* | −1.046* | 0.530 | 17.258** | 8.953 |
| *Goodness of fit* | | | | |
| $R^2$ (Adjusted) | – | | 0.100 | |
| Log likelihood | | | | |
| Full model | −731.63 | | – | |
| Intercept only | −974.54 | | – | |
| Chi-squared | 485.83 | | – | |
| % correctly predicted | 74.68 | | – | |
| Number of cases | 1,406 | | 707 | |

* $p < 0.05$; ** $p < 0.01$

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