# THE DEVELOPMENT AND FISCAL EFFECTS OF EMIGRATION ON MEXICO

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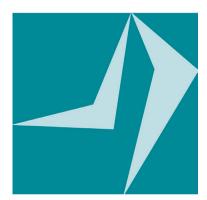
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### **Executive Summary**

The consequences of emigration on development in migrants' countries of origin have been the subject of extensive reflection and debate, yet the precise interaction of positive and negative impacts remains complex and often misunderstood. In general, the balance of costs and benefits of migration for Mexico's economic and fiscal outlook depends on the magnitude of migration, the demographic and socioeconomic characteristics of migrants, and the combined effects on the wages and education investments of those who stay. Compared to the overall Mexican population, migrants are younger, more likely to be male, and are less educated. This is notably different from migration elsewhere in the world where migrants tend to be older and better educated than the overall population, and is an important advantage for Mexico.

## Between 1990 and 2000 migration increased wages by 8 percent in Mexico with more pronounced effects among less-educated workers.

The two most important ways that migration influences development in Mexico is through remittances and labor markets. Mexico is the largest recipient of remittances in Latin America, with remittances totaling \$22 billion (about 2.5 percent of its gross domestic product) in 2010. In some states, such as in Guerrero, Michoacan, and Oaxaca, remittances are even more important to the local economy. Among the poorest tenth of Mexican households, remittances account for over half of total income. Research shows that remittances improve access to health care and basic schooling, but can also serve as a disincentive to higher education. Focusing on labor markets, existing research suggests that between 1990 and 2000 migration increased wages by 8 percent in Mexico with more pronounced effects among less-educated workers.

When the labor market effects and household income benefits of remittances are compiled into a model of the Mexican economy, Mexico's fiscal balance appears to benefit. Under standard assumptions modeling the scale of migration and remittances over the last decade, this report estimates that Mexico's economic output (GDP) increased by 8.8 percent and its tax collection increased by 7.4 percent.

Migration patterns are rapidly evolving as a result of demographic change in Mexico and the lingering effects of the recent recession in the United States. Migration has slowed dramatically in recent years. There is little doubt that these changes will have long-term consequences for the effects of migration on Mexico's economy, although the precise magnitude remains uncertain.



#### I. Introduction

The consequences of emigration on development in migrants' countries of origin have been the subject of extensive reflection and debate, yet the precise interaction of positive and negative impacts remains complex and often misunderstood. On balance, the empirical evidence is mixed: large-scale emigration and rapid economic development have coincided in some parts of the world and not in others. The impacts of migration — both positive and negative — appear to vary according to a wide range of factors, including migrants' demographic and socioeconomic characteristics, and the general economic and political climate of their countries of origin. The unit of analysis used (e.g., household, local, or national) also seems to affect study results.

In few places are these ambiguous outcomes as apparent as in the case of Mexican migration to the United States. More than one in ten Mexicans reside in the United States, and there is a deep (and still growing) body of research on the implications of these flows for Mexico. This literature analyzes how migration affects Mexico's social, political, and economic life at all levels of society, from the household to municipal, state, and federal levels.<sup>3</sup> However, there is surprisingly little analysis of the net consequences of emigration for Mexico's public finances. This report aims to address this knowledge gap.

## Large-scale emigration and rapid economic development have coincided in some parts of the world and not in others.

The fiscal impacts of emigration are complex.<sup>4</sup> To estimate them, one must know the magnitude of migration, the characteristics of those migrating, and the possible combined effects on the wages and education investments of those who stay. We focus on two important ways that migration influences development outcomes in migrants' communities of origin:

- Labor markets and wages. In order to assess the impact of migration on Mexican labor markets and wages, we take into consideration the type of migrants who leave the country (i.e., their age, sex, education, and socioeconomic status). We also account for higher rates of return migration among certain subgroups.
- *Remittances*. Remittances represent 2.5 percent of gross domestic product (GDP) in Mexico and are particularly important for poorer households and several poorer states. There is growing evidence of the positive impacts of remittances on critical human-capital indicators, including poverty, health, and schooling.

For a recent review, see Aaron Terrazas, *Migration and Development: Policy Perspectives from the United States* (Washington, DC: Migration Policy Institute, 2011), <a href="https://www.migrationpolicy.org/pubs/migdevpolicy-2011.pdf">www.migrationpolicy.org/pubs/migdevpolicy-2011.pdf</a>.

This is a similar conclusion to the consensus view on the impact of migration on destination countries. See Harry J. Holzer, Immigration Policy and Less-Skilled Workers in the United States: Reflections on Future Directions for Reform (Washington, DC: Migration Policy Institute, 2011), <a href="https://www.migrationpolicy.org/pubs/Holzer-January2011.pdf">www.migrationpolicy.org/pubs/Holzer-January2011.pdf</a>.

<sup>3</sup> Gordon H. Hanson and Craig McIntosh, "The Great Mexican Emigration," *The Review of Economics and Statistics* 92, no. 4 (2010): 798–810.

Similar "fiscal impact" studies on the consequences of immigration for local public finances are commonly undertaken in the United States for various levels of government. However, to our knowledge, no similarly rigorous and comprehensive analysis exists for public finances in origin countries. See for example, Congressional Budget Office (CBO), The Impact of Unauthorized Immigrants on the Budgets of State and Local Governments (Washington, DC: CBO, 2007), <a href="https://www.cbo.gov/ftpdocs/87xx/doc8711/12-6-Immigration.pdf">www.cbo.gov/ftpdocs/87xx/doc8711/12-6-Immigration.pdf</a>.



Beyond labor markets and remittances, there is a growing body of research on how migrants contribute to social and industrial innovation in their countries of origin. Given the methodological challenges of measuring the economic impacts of innovation, however, we do not take these impacts into consideration. Overall, this report does not attempt to definitively settle the question of how immigration affects fiscal revenue; instead, it provides a reasonable analysis of this question, along with quantitative estimates, in an effort to inform policy discussions. Under standard assumptions (outlined below), and once remittances are taken into account, we calculate that migration is a net positive for Mexico in terms of GDP and fiscal revenue.

### II. Migration and Development

This section reviews the extensive empirical evidence on the effects of migration on development in Mexico.<sup>5</sup> It first looks at the demographic and socioeconomic characteristics of migrants, nonmigrants, and returnees, and then turns to the impacts of migration on wages in Mexico. Finally, it provides evidence of the importance of remittances and their impact on poverty and human-capital accumulation.

#### A. Who Migrates and Who Returns?

When assessing the net effects of migration on origin countries, one of the most important questions to ask is whether those who leave are similar to or different from those who stay. Economic theory suggests that if migrants have a similar or lesser degree of education and income than the overall population, their departure will increase wages for most people. By contrast, if migrants are better educated and have higher incomes than the rest of the population — known by economists as "positive selection" — their departure will leave the general population worse off. This basic theory is admittedly simplistic, but is a starting point for any discussion of the consequences of migration for origin countries.

## One of the most important questions to ask is whether those who leave are similar to or different from those who stay.

In most countries, migrants are *positively selected* from the general population since some initial resources are typically necessary to undertake migration and since many receiving countries have admission policies that favor better-educated and wealthier migrants.<sup>6</sup> By most accounts, Mexico is different, although the evidence is mixed.

Evidence from the past three decades suggests that there is intermediate selection among Mexican-born men (i.e., for the most part, Mexican migrant men resemble nonmigrant men in terms of education and income) and positive selection among Mexican-born women. However, when one accounts for reporting errors and low response rates among unauthorized immigrants, Mexican migrants of both sexes appear

For a more general review, see Gordon H. Hanson "International Migration and Development" (working paper 42, Commission on Growth and Development, The World Bank, 2008), <a href="www.growthcommission.org/storage/cgdev/documents/.pdf">www.growthcommission.org/storage/cgdev/documents/.pdf</a>; and Gordon H. Hanson, "The Economic Consequences of the International Migration of Labor," *Annual Review of Economics* 1 (2009): 179–208.

<sup>6</sup> Jeffrey Grogger and Gordon H. Hanson, "Income Maximization and the Selection and Sorting of International Migrants," *Journal of Development Economics* 95, no. 1 (2011): 42–57.



to be less educated than the overall population. Moreover, there appear to be differences between those communities with a long history of migration and those with little experience and weak migrant networks. In two recent studies, economists David McKenzie and Hillel Rapoport found that communities with large migrant networks show negative selection, while communities with small migrant networks show positive selection. Presumably, strong social networks reduce the costs of migration, making it a more feasible option for individuals from lower socioeconomic groups.

Just as there is selection among Mexicans who depart, there is also selection among Mexicans who decide to return after residing for some time in the United States. Although most of the evidence points towards an intermediate selection effect among those who leave, there is little research on the type of migrants who return to Mexico. Evidence from 1990-2000 indicates intermediate selection among return migrants — in other words, return migrants are neither the best nor worst educated among the total migrant population, but rather are from the middle of the education distribution. However, in the past decade there has been a noticeable increase in negative selection for both returning women and returning men. These trends predate the global recession that began in 2007 and, accordingly, are not simply a result of the economic crisis. Despite this negative selection, recent research suggests that the wages of return migrant males are 5 percent higher than they would have been if these men had not migrated, although this wage premium has declined over time. This represents a positive effect of migration on the Mexican economy that has been neglected in previous literature about Mexican migration to the United States.

Data from Mexico's 2010 census show how emigration and return migration trends have evolved over the past decade. Between 2000 and 2010, an estimated 2.8 million Mexicans ages 16 to 40-1.62 million males and 1.14 million females — departed for destinations abroad, with almost all going to the United States. They accounted for about 6.8 percent of all males and 4.6 percent of all females in the age group. US data suggest a similar scale: estimates from the Migration Policy Institute (MPI) and Pew Hispanic Center show that total migration from Mexico into the United States increased over the decade by close to 2.4 million.

Daniel Chiquiar and Gordon Hanson, "International Migration, Self-Selection, and the Distribution of Wages," *Journal of Political Economy* 113, no. 2 (2005): 239–81; Pablo Ibarraran and Darren Lubotsky, "Mexican Immigration and Self-Selection: New Evidence from the 2000 Mexican Census," in *Mexican Migration to the United States*, ed. George Borjas (Chicago: University of Chicago Press and National Bureau of Economic Research, 2007); Jesús Fernandez-Huertas, "New Evidence on Emigrant Selection," *Review of Economics and Statistics* 93, no. 1 (2011): 72–96.

David McKenzie and Hillel Rapoport, "Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico," Journal of Development Economics 84 (2007): 1–24; David McKenzie and Hillel Rapoport, "Self-Selection Patterns in Mexico-U.S. Migration: The Role of Migration Networks," The Review of Economics and Statistics 92, no. 4 (2010): 811–21. Data from the Mexican Migration Project, a household survey of 52 Mexican communities with a long history of migration to the United States, confirm this finding, showing that most migrants are neither poor nor rich, but rather are from the middle of the skill distribution. Pia M. Orrenius and Madeline Zavodny, "Self-Selection Among Undocumented Immigrants From Mexico," Journal of Development Economics 78, no. 1 (2005): 215–40; Robert Kaestner and Ofer Malamud, "Self-Selection and International Migration: New Evidence from Mexico" (working paper 15765, National Bureau of Economic Research, 2010), <a href="https://www.nber.org/papers/w15765.pdf">www.nber.org/papers/w15765.pdf</a>.

<sup>9</sup> Raymundo Campos-Vazquez and Jaime Lara, "Self-Selection Patterns Among Return Migrants: Mexico 1990-2010" (working paper IX-2011, Centro de Estudios Económicos, El Colegio de México, September 2011), <a href="http://centros.colmex.mx/cee/images/horizontal/publicaciones/dt/2011/dt-ix-2011.pdf">http://centros.colmex.mx/cee/images/horizontal/publicaciones/dt/2011/dt-ix-2011.pdf</a>.

<sup>10</sup> For example, data from the 2006 Encuesta Nacional de la Dinámica Demográfica (ENADID) are similar to results of the 2010 census.

<sup>11</sup> Campos-Vasquez and Lara, "Self-Selection Patterns Among Return Migrants." One possible explanation of this result is that return migrants gain human capital and/or accumulate savings in their time abroad.

<sup>12</sup> These numbers are obtained by using total population in 2000 and 2010 and adjusting by mortality. We obtained mortality figures in this period using vital records from the Instituto Nacional de Estadística y Geografía (INEGI).

<sup>13</sup> Aaron Terrazas, *Mexican Immigrants in the United States* (Washington, DC: Migration Policy Institute, 2010), www.migrationinformation.org/USfocus/display.cfm?ID=767; Pew Hispanic Center, *Statistical Portrait of the Foreign-Born Population in the United States*, 2009 (Washington, DC: Pew Hispanic Center, 2011), pewhispanic.org/factsheets/factsheet.php?FactsheetID=69.



Similar to the past, young adults were most likely to migrate. Figure 1 shows the emigration rate in the period 2000-10 for those ages 16 to 40.14 Several important trends emerge:

- As previous studies have shown, emigration rates are higher among young males.<sup>15</sup> The highest emigration rate was for males 25 years of age, of whom close to 14 percent departed. The highest emigration rate for women was among those aged 29.
- The female emigration rate was higher than the male emigration rate for individuals older than 32. This is the result of family dynamics: in some cases a male household head initially departs and saves until he can afford to pay for his family to join him abroad.

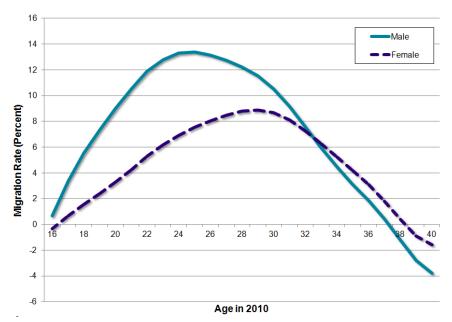


Figure 1. Overall Net Emigration Rate from Mexico, 2000-10

Note: The migration rate is calculated using 2000 as the base year. Data are not adjusted for mortality. Source: Authors' calculation data from the 2000 and 2010 Mexican censuses.

There are negative emigration rates for individuals older than 38. The likely explanation is that many migrants in the United States returned to Mexico due to the economic crisis or were forcibly removed as the US government increased deportations in recent years.

Over the past two decades, the places in Mexico where migrants tend to originate have shifted. Prior to the 1990s, most migrants came from central and western Mexico; then, during the 1990s and 2000s, a growing number of migrants began coming from southern Mexico. Figure 2 illustrates emigration rates by state. As expected, the traditional migrant states are Guanajuato, Guerrero, Michoacán, Morelos, and Zacatecas. However, there are some new states with large emigration rates. For example, Oaxaca — one of the poorest states in Mexico — has the second-largest emigration rate. Two other states with unexpectedly large migrant flows are Chihuahua and Tamaulipas. There are a number of potential explanations for the high observed emigration rates of these two border states.

<sup>14</sup> We follow the calculations of Hanson and McIntosh but apply their methods to the period 2000-10. In particular, we use 2000 as the base year. We calculate the number of people in 2000 by sex, and then subtract the observed population in 2010. Data are not adjusted for mortality rates. We do this by each year of age. We plot a smooth function (using LOWESS regression) for the emigration rate across age groups.

<sup>15</sup> Hanson and McIntosh, "The Great Mexican Emigration."



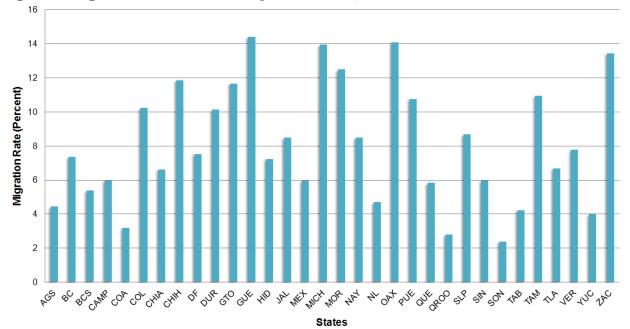


Figure 2. Emigration Rate from Mexico by State of Birth, 2000-10

Note: Abbreviations are as follows: AGS, Aguascalientes; BC, Baja California Norte; BCS, Baja California Sur; CAMP, Campeche; COA, Coahuila; COL, Colima; CHIA, Chiapas; CHIH, Chihuahua; DF, Distrito Federal; DUR, Durango; GTO, Guanajuato; GUE, Guerrero; HID, Hidalgo; JAL, Jalisco; MEX, Estado de Mexico; MICH, Michoacan; MOR, Morelos; NAY, Nayarit; NL, Nuevo Leon; OAX, Oaxaca; PUE, Puebla; QUE, Queretaro; QROO, Quintana Roo; SLP, San Luis Potosi; SIN, Sinaloa; SON, Sonora; TAB, Tabasco; TAM, Tamaulipas; TLA, Tlaxcala; VER, Veracruz; YUC, Yucatan; ZAC, Zacatecas.

Source: Authors' calculations using Mexican census data from 2000 and 2010.

Table 1 compares the demographic and socioeconomic characteristics of the Mexican population ages 16-40, distinguishing between individuals who did not migrate and who belong to a household with no migrants (labeled "stayers"), individuals belonging to a migrant household, and return migrants. In line with recent findings of a general slowdown in migration, the table shows that in 2000 about 4 percent of the population lived in households with some migrant experience, but by 2010 this share had declined to about 3 percent.<sup>16</sup>

In addition, Table 1 shows several important patterns:

- Stayers are younger than return migrants.
- The educational level of stayers is, on average, higher than individuals in migrant households or return migrants.
- Stayers are also more geographically concentrated, especially in rural areas.
- Return migrants are overwhelmingly male (75 percent) and older than nonreturnees.
- Return migrants are also more geographically concentrated and have lower education levels than stayers.
- The education level of return migrants is similar to individuals in households with migrants.

Together Figure 1 and Table 1 show that in general the average migrant is a young individual (ages 16-25), most likely male, with an educational level of secondary school completion or lower.

<sup>16</sup> Hanson, *Emigration, Labor Supply, and Earnings in Mexico*.



Table 1. Descriptive Characteristics, Mexican Individuals, Ages 16-40, (%), 2000 and 2010

	2000			2010		
	Stayer	Migrant Household	Return Migrant	Stayer	Migrant Household	Return Migrant
Share population	95.7	3.5	8	96.6	1.9	1.5
Age (years)	26.9	25	28.4	27.3	25.1	29.7
Female	52	61	26	52	60	25
Rural	21	37	32	21	44	37
High-migration region	19	43	45	21	38	36
Low-migration region	15	7	4	15	10	9
Married	57	41	66	54	42	69
Schooling (years)	8.7	7.8	8.2	9.8	8.8	8.7
No education	4	4	2	3	3	1
Primary incomplete	12	15	14	7	9	9
Primary	24	30	30	18	24	28
Secondary	32	32	31	37	41	39
High school	22	15	18	29	20	20
College	6	3	4	6	3	3
Working	56	47	61	55	46	68

Notes: Stayers are not part of migrant households. A person in a migrant household is an individual belonging to a household with an international migrant. Return migrants returned from the United States in the previous five years. The high-migration region includes Aguascalientes, Durango, Guanajuato, Jalisco, Michoacán, San Luis Potosí, and Zacatecas. Low-migration states are Campeche, Chiapas, Quintana Roo, Tabasco, and Veracruz.

Source: Authors' calculations using Mexican censuses for 2000 and 2010.

#### B. Remittances

Remittances are the most concrete and well-known benefit that migration affords to origin countries. Remittances, or the labor income that individual migrants save and send to their families in the origin country, have many of the same positive effects on individual and household well-being as domestic sources of labor income. In addition, remittances are similar to export earnings in their effects on a country's macroeconomic situation: they represent a stable source of foreign earnings, allowing the country greater capacity to import goods and services and, in some instances, allowing it access

Remittances are the most concrete and well-known benefit that migration affords to origin countries.



to preferential loans in international capital markets. However, they can also increase demand for local currency, reducing export competitiveness. This section focuses mainly on the consequences of remittances for individuals and households.

#### I. Outlook

According to World Bank data, in 2010 Mexico received close to \$22 billion in remittances and other foreign income, about 2.5 percent of its GDP.<sup>17</sup> Mexico is by far the largest recipient of remittances in Latin America and the Caribbean; however, in relative terms (as share of GDP) remittances are far more important to the economies of Honduras and El Salvador, where they represent 19 percent and 15 percent of GDP respectively.<sup>18</sup> However, the aggregate numbers hide important heterogeneity across Mexican states: the states with the largest inflows are Guerrero, Hidalgo, Michoacán, Oaxaca, and Zacatecas (see Figure 3). The mean share of remittances as a percentage of GDP is a little higher than 10 percent, similar to the share in Guatemala. As Figure 3 illustrates, remittances are a very important source of income for the economies of some Mexican states, particularly those where foreign direct investment (FDI) is low.

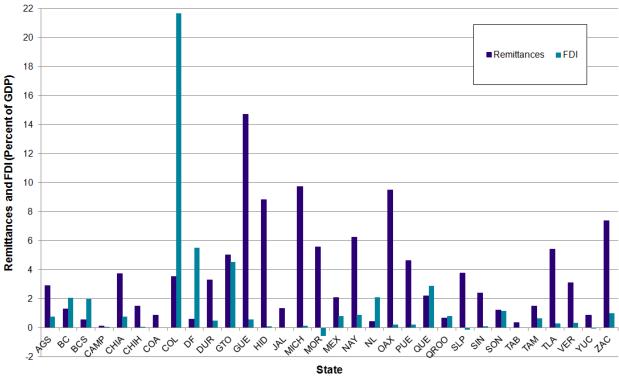


Figure 3. Remittances and Foreign Direct Investment (FDI) as a Share of GDP in Mexico, by State, 2009

Notes: The state of Colima is not included for comparison purposes. Its share of remittances is equal to 3.5 percent and the share of FDI is equal to 21.6 percent. Abbreviations: AGS, Aguascalientes; BC, Baja California Norte; BCS, Baja California Sur; CAMP, Campeche; COA, Coahuila; COL, Colima; CHIA, Chiapas; CHIH, Chihuahua; DF, Distrito Federal; DUR, Durango; GTO, Guanajuato; GUE, Guerrero; HID, Hidalgo; JAL, Jalisco; MEX, Estado de Mexico; MICH, Michoacan; MOR, Morelos; NAY, Nayarit; NL, Nuevo Leon; OAX, Oaxaca; PUE, Puebla; QUE, Queretaro; QROO, Quintana Roo; SLP, San Luis Potosi; SIN, Sinaloa; SON, Sonora; TAB, Tabasco; TAM, Tamaulipas; TLA, Tlaxcala; VER, Veracruz; YUC, Yucatan; ZAC, Zacatecas.

Sources: Remittances by state are obtained from Banco de Mexico; GDP and FDI by state are obtained from INEGI; FDI is obtained from "V Informe del Gobierno Federal," and the deflator in dollars is obtained from GDP as reported by the World Bank.

<sup>17</sup> World Bank, "Latin America: Remittances Making a Healthy Recovery in 2010," (news release, November 8, 2010), <a href="https://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,.contentMDK:22758380~pagePK:146736~piPK:146830">https://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/LACEXT/0,.contentMDK:22758380~pagePK:146736~piPK:146830</a> ~theSitePK:258554,00.html.

<sup>18</sup> World Bank, Migration and Remittances Factbook 2011 Second Edition (Washington, DC: World Bank, 2011), http://siteresources.worldbank.org/INTLAC/Resources/Factbook2011-Ebook.pdf.



#### 2. Distribution

In order to assess the types of households that receive remittances and the share of remittances in total household income, we rely on data from the 2010 National Survey of Household Income and Expenditures (Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH). According to this survey, 4.6 percent of households in Mexico receive remittances. As previously mentioned, poorer households are more likely to receive remittances, and remittances are a larger share of their total income (Figure 4). Among the poorest tenth of Mexican households, remittances represent more than half of total income; nearly three-quarters of remittances go to the poorest half of Mexican households.

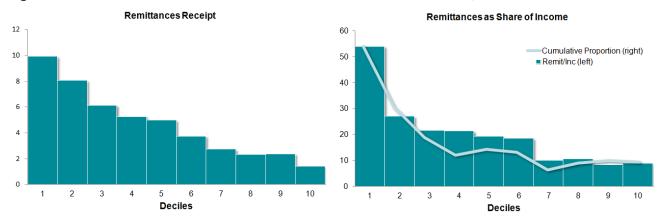


Figure 4. Remittances Received in Mexico as Share of Household Income, 2010

*Notes*: We use per capita total income minus remittances per capita to calculate income deciles. Panel A calculates the percent of households in each decile that receive remittances and Panel B calculates the proportion of remittances in terms of total income for those with positive remittances. The solid line indicates the total share of remittances across all deciles. Hence, the solid line in the 1st decile implies that from total remittances in the economy, 30 percent goes to the 1st decile of income net of remittances. *Source*: Authors' calculations using 2010 National Survey of Household Income and Expenditures.

#### 3. Poverty and Inequality

Most existing research suggests that remittances are associated with declines in poverty and inequality, although the magnitude of the declines is very small. For instance, the World Bank estimates that a percentage point increase in remittances as a share of GDP reduces inequality (as measured by the Gini coefficient) by around 0.08 percent and reduces poverty by 0.37 percent.<sup>20</sup>

In the case of Mexico, the evidence of the effect of remittances on poverty is, on the whole, consistent with these World Bank findings.<sup>21</sup> Evidence suggests that remittances reduce poverty, but although remittances may alleviate extreme poverty, only rarely can they permanently lift individuals from poverty.

#### 4. Human Capital and Education

The theoretical impact of migration and remittances on human capital is ambiguous. On one hand, if

<sup>19</sup> Census data show a similar number. Table 1 includes only individuals ages 16-40, and so does not include households formed by individuals in other age groups.

<sup>20</sup> Pablo Acosta, Cesar Calderon, Pablo Fajnzylber, and Humberto Lopez, "What is the Impact of International Remittances on Poverty and Inequality in Latin America?" *World Development* 36, no. 1 (2008): 89–114.

<sup>21</sup> Gerardo Esquivel and Alejandra Huerta-Pineda, "Remittances and Poverty in Mexico," *Integration and Trade* 27 (2007): 45–71; Ernesto López-Córdova, "Globalization, Migration, and Development: The Role of Mexican Migrant Remittances," *Economia* 6, no. 1 (2005): 217–56; Pia M. Orrenius, Madeline Zavodny, Jesús Cañas, and Roberto Coronado, "Do Remittances Boost Economic Development? Evidence from Mexican States" (working paper, Federal Reserve Bank of Dallas, February 2009), <a href="https://siteresources.worldbank.org/INTINTERNATIONAL/Resources/1572846-1253029981787/6437326-1253030102669/Orrenius.pdf">http://siteresources.worldbank.org/INTINTERNATIONAL/Resources/1572846-1253029981787/6437326-1253030102669/Orrenius.pdf</a>; Alejandro Lopez Feldman, "Migration History, Remittances and Poverty in Mexico," *Economics Bulletin* 31, no. 2 (2011): 1256–64.



the head of the household migrates and sends remittances from the destination country to the source country, we expect higher income in that household. With greater resources, the household may decide to invest in human capital. However, the absence of parental authority may disrupt a child's education or create incentives for early labor market entry.

The empirical evidence for Mexico is mixed. Ernesto López-Córdoba finds that remittances improve school attendance rates for children, but they worsen educational outcomes for teenagers, <sup>22</sup> while Gordon Hanson and Christopher Woodruff find that girls in migrant households complete more schooling than children in nonmigrant households. <sup>23</sup> The Bank of Mexico focuses on individuals in the 12-16 age group and concludes that during the recent economic crisis, school attendance rates decreased by 15 percentage points in households with remittances versus a smaller decline among other households. <sup>24</sup>

Based on interviews with youth in high-migration communities, William Kandel and Grace Kao conclude that fewer individuals in migrant households have aspirations to attend college than in nonmigrant households. More recent evidence suggests that boys in migrant households are 22 percent less likely to finish junior high school, and 14 percent less likely to finish high school. (By contrast, girls with less-educated mothers in migrant households may have better educational outcomes.) Using 2000 census data, sociologist Andrew Halpern-Manners finds similar large negative results for youth ages 15-18: children in migrant households are close to 15 percent less likely to enroll in lower secondary classes and 17 percent less likely to enroll in high school.

Figure 5 compares school enrollment rates in Mexican states with high and low levels of migration.<sup>29</sup> Although the differences are not large, Panel B shows that the high school enrollment rate in those states with high migration rates is smaller than in the low-migration states.

#### 5. Health

In terms of health, the net effect of migration and remittances is positive. Children born in households with at least one migrant member are less likely to die in their first year than children in nonmigrant households. Similarly, there is a negative impact of remittances on infant mortality. Moreover, health expenditures are three times more sensitive to remittance income than other sources of income. This leads to the conclusion that remittances act as an insurance device for those without health insurance, and as such, equalize health expenditures across households. Hence, the evidence suggests that remittances are related to better health outcomes, mainly due to a larger expenditure on health.

- 22 López-Córdova, Globalization, Migration, and Development.
- 23 Gordon H. Hanson and Christopher Woodruff, "Emigration and Educational Attainment in Mexico" (working paper, University of California, 2003), <a href="https://irps.ucsd.edu/assets/022/8772.pdf">http://irps.ucsd.edu/assets/022/8772.pdf</a>.
- 24 Carlo Alcaraz, Daniel Chiquiar, and Alejandrina Salcedo, "Remittances, Schooling and Child Labor in Mexico," *Journal of Development Economics* 97, no. 1 (2012): 156–65.
- 25 William Kandel and Grace Kao, "The Impact of Temporary Labor Migration on Mexican Children's Educational Aspirations and Performance," *International Migration Review* 35, no. 4 (2001): 1205–31.
- 26 David McKenzie and Hillel Rapoport, "Can Migration Reduce Educational Attainment? Evidence from Mexico," *Journal of Population Economics* 24 (2011): 1331–58. Other studies collaborate these findings; see Hanson and Woodruff, *Emigration and Educational Attainment in Mexico*.
- 27 Ibid.
- 28 Andrew Halpern-Manners, "The Effects of Family Member Migration on Education and Work among Nonmigrant Youth in Mexico," *Demography* 48, no. 1 (2011): 73–99.
- 29 In order to compare enrollment rates across states, we use data published by the Ministry of Education about the percent of individuals in each state attending school. We report only enrollment rates for secondary (7-9 years of schooling) and high school (10-12 years of schooling), given that enrollment rates for primary education are high for both states. High migrant states are Aguascalientes, Durango, Guanajuato, Jalisco, Michoacan, San Luis Potosi, and Zacatecas. Low migrant states are Campeche, Chiapas, Quintana Roo, Tabasco, Veracruz, and Yucatan. Data available from Secretaría de Educación Pública, Dirección General de Planeación y Programación, "Estadística e Indicadores," www.dgpp.sep.gob.mx/estadistica.html.
- 30 Nicole Hildebrandt and David McKenzie, "The Effects of Migration on Child Health in Mexico," *Economia* 6, no. 1 (2005): 257–89
- 31 López-Córdova, Globalization, Migration, and Development.
- 32 Catalina Amuedo-Dorantes and Susan Pozo, "Remittances and Income Smoothing," *American Economic Review* 101, no. 3 (2011): 582–87.



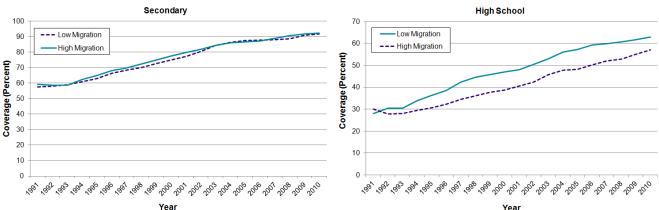


Figure 5. Enrollment Rates in Secondary and High School: Low-Migration versus High-Migration States, 1990-2010

Source: Authors' calculations using data from Secretaria de Educación Pública, www.dgpp.sep.gob.mx/estadistica.html.

#### C. Labor Supply and Earnings

A critical assumption of economic theory is that migration leads to wage convergence across countries since migrants depart from countries with surplus labor, leading to wage increases, and move to countries with labor shortages, which controls wage inflation. There is some evidence of wage convergence as a result of migration between North America and Western Europe during the age of mass migration at the end of the  $19^{th}$  and early  $20^{th}$  centuries and, more recently, among the Member States of the European Union.

A small body of research focuses on the effect of a reduced labor supply (due to emigration) on wages in Mexico. A traditional supply-and-demand model predicts that if labor supply falls, wages should increase among those who remain. Independent studies on the Mexican labor market suggest that a 1 percent increase in the number of departing migrants increases wages by 0.4 percent on average, with differences across skill levels. Recent findings show that this translates into a wage increase of about 8 percent in Mexico.<sup>34</sup> The effect for medium- to low-skilled workers is more pronounced.

On balance, research confirms that migration prompts higher wages in Mexico — particularly among the poor and less educated. These wage effects have important implications for tax revenues and public expenditures on anti-poverty programs.

### III. Fiscal Impacts of Emigration

In principle, the fiscal impacts of migration are difficult to estimate because they result from many simultaneous decisions within a single economy (what economists label "general equilibrium effects").

<sup>33</sup> Timothy Hatton and Jeffrey Williamson, eds., *Migration and the International Labor Market 1850-1939* (London: Routledge, 1994) and Martin Kahanec and Klaus F. Zimmermann, eds., *EU Labor Markets After Post-Enlargement Migration* (New York: Springer, 2009).

Prachi Mishra, "Emigration and Wages in Source Countries: Evidence from Mexico," *Journal of Development Economics* 82 (2007): 180–99; Abdurrahman Aydemir and George J. Borjas, "A Comparative Analysis of the Labor Market Impact of International Migration: Canada, Mexico, and the United States," *Journal of the European Economic Association* 5, no. 4 (2007): 663–708. Hanson estimates a higher wage elasticity in part because he compares high-migration and low-migrations states and restricts his study to the period 1990-2000. See Gordon Hanson, "Emigration, Labor Supply, and Earnings in Mexico," in *Mexican Migration to the United States*, ed. George Borjas (Chicago: University of Chicago Press and National Bureau of Economic Research, 2007).



Moreover, the impacts are due not only to changes in the tax base, but also the size and composition of public expenditures on education, health, poverty alleviation, and other public services. Attempts to estimate the fiscal impacts of migration are scarce, yet the increasing flows of migration all over the world suggest that the long-term effects on the tax bases of both sending and receiving countries might be significant. From the public policy perspective, estimates of these effects are and will be important to the design of policy reforms.

In this section we present some initial estimates of the fiscal impact of emigration on Mexico using a very simple model.<sup>36</sup> (For a description of the model, see the Appendix.) The idea is not necessarily to forecast tax collection, but to obtain a general idea of the magnitude of the changes in tax receipts and expenditures that result from migration. Below, we present the results of three hypothetical scenarios:

- The first scenario assumes a reduction of the labor force (assumed to be fixed) by 6 percent, which is consistent with the percentage of Mexican migrants over the past decade.
- The second scenario assumes that wages are fixed and are increased by 8 percent, according to some estimates of the wage effects of migration presented in the previous section.
- The third scenario combines a reduction of the labor force (as in Scenario 1) with an increase of the capital stock of 18.3 percent, based on the magnitude of remittances accumulated in the period 2003-09. The accumulated remittances in the period (adjusted for inflation to 2003 prices) represented 12 percent of GDP in the simulation year.

Table 2 compares these scenarios. The results should be carefully interpreted because they are not forecasts. Instead they should be seen as possible adjustments. The model is static and does not account for the dynamics of the adjustment; it simply assumes that changes take place over a single period.

Scenario	GDP	Tax Collection
1	-2.4	-2.0
2	-3.6	-3.0
3	8.8	7.4

Table 2. Fiscal Impacts of Migration on Mexico (percent changes)

Notes: Scenario 1 assumes a reduction of the labor force (assumed to be fixed) by 6 percent. Scenario 2 assumes that wages are fixed and are increased by 8 percent. Scenario 3 combines a reduction of the labor force (as in Scenario 1) with an increase of the capital stock of 18.3 percent.

Source: Authors' estimation.

Scenario 1 suggests that emigration induces a reduction in GDP of 2.4 percent and 2 percent of public revenues. The reduction of GDP is explained in part by the fact that wages increase by 5.3 percent. On the other hand, Scenario 2 induces a reduction in GDP of 3.6 percent and one in public revenues of 3.0 percent, which is explained by the 8 percent increase in wages (the price of capital falls 3 percent). Finally, Scenario 3 results in a GDP increase of 8.8 percent and a tax collection increase of 7.4 percent. Clearly, public revenues do not grow too much because the involved changes in factor prices are considerable (wages grow 15 percent but the price of capital is reduced by almost 10 percent). As can be seen, the effects are mixed but the results suggest that, in fiscal terms and once remittances are taken into account, Mexico benefits.

<sup>35</sup> See Mihir A. Desai et al., "The Fiscal Impact of High-Skilled Emigration: Flows of Indians into the US," *Journal of Development Economics* 88 (2009): 32–44.

<sup>36</sup> We use an applied general equilibrium model.



The model is admittedly imperfect, and a more precise estimation would require a finer disaggregation of the labor markets because the magnitudes change depending on the characteristics of the population that is emigrating — both because of differences in earnings and in expenditures. Second, while we refer here to the effects on public revenues, nothing has been said about public expenditures or the effects of variables such as human capital. In the long term they undoubtedly will impact the potential GDP growth rate of the economy and, therefore, the net fiscal effects.

#### IV. Conclusions

Unlike migration from elsewhere in the world, Mexican migrants to the United States do not originate from the best-educated and wealthiest segments of the population. As a result, migration is a critical contributor to reducing poverty and promoting intergenerational mobility. However, as in the United States, the consequences of migration for the broader society are the subject of substantial political debate.

Using census data for the period 2000-10, we found that 2.8 million Mexicans ages 16-49 emigrated over the decade. This implies an emigration rate for this age group of 5.6 percent. In particular, we found that emigration rates follow an inverted-U shape with a peak for males aged 25 and females aged 29. The highest emigration rate among males was 14 percent and among females, 9 percent. Although migrants continue to come from historic migrant-sending states, an increasing share are coming from other states. In particular, we find that Chihuahua and Tamaulipas are now among the top ten sending states.

## Mexican migrants to the United States do not originate from the best-educated and wealthiest segments of the population.

Remittances represent 2.5 percent of GDP in Mexico and are far more important in some states and communities than others. For example, the state of Guerrero, a poor southern state, receives 15 percent of GDP in remittances. Moreover, remittances are an important source of income for poorer households. We calculate that poorer households are more likely to receive remittances; for the poorest decile in the income distribution, remittances represent close to half of total income. It is not clear yet how this large inflow of remittances is used by receiving households. However, previous findings suggest that health expenditures are sensitive to remittances, implying that remittances are important to those without health insurance.

Previous findings suggest that remittances are an important tool to alleviate poverty. However, they also point out that although remittances help alleviate poverty, they cannot solve the problem by itself. In particular, the impact on schooling outcomes is mixed. While remittances relax household budget constraints, allowing children to remain enrolled in school for longer periods of time, they may also create perverse incentives. Since demand for Mexican immigrant labor in the United States has traditionally been concentrated in occupations that require little formal education, many Mexican youth did not see the value of pursuing higher education. The US economy has changed dramatically as a result of the recent recession, and demand is expected to remain lower for some of the jobs that Mexican immigrants used to fill, notably in construction. The consequences of these changes in the US economy for the education decisions of Mexican youth will be an important trend for the coming decade.



In terms of the fiscal impacts of migration, we calculate that once remittances are taken into account, migration is positive in terms of GDP and fiscal revenue. This is mainly due to the positive impacts of remittances on investment and capital formation, which in the long run promote growth and development. However, as pointed out before, more research is needed to understand how remittance flows are used by receiving households.

## We calculate that once remittances are taken into account, migration is positive in terms of GDP and fiscal revenue.

The dynamics of migration from Mexico to the United States are rapidly evolving. Mexico's population is growing more slowly than in the past and its youth are better educated than ever before. At the same time, US economic growth is slowing — in part due to the recent recession and preceding consumption bubble, but also due to shifting demographics and the exit of the large baby boom generation from the workforce. The US economy is expected to slow in the coming years and the flow of migrants from Mexico has responded to these more limited prospects. Individual migrants are likely to continue sending remittances to their families back home even after new inflows slow. But in the long term, as the Mexican population in the United States shifts from a population primarily born in Mexico to a population primarily born in the United States, these cross-border ties will inevitably weaken. The consequences of these changing migration dynamics for Mexico's development prospects will be an important trend for the next decade.



### **Appendix**

The fiscal impact analysis is based on an Applied General Equilibrium Model (AGEM). The AGEM is, admittedly, not the only or the best tool of analysis, but it is defensible since it incorporates, in a single framework, the interaction of labor and commodity markets together with the composition of expenditures by income levels. These elements are essential for capturing net fiscal effects.

The model is calibrated for the base year of 2003 in Mexico. It uses data on national income, tax revenues, and household expenditures disaggregated by income level based on official data. The model is thus based on a very simple but strategic disaggregation of labor and commodity markets as well as expenditures by income levels. On the commodity markets we identify three types of commodity sectors:

- traded goods subject to taxation
- traded goods subject to zero value added (VAT) tax, (e.g. food and medicines)
- nontraded taxed goods (i.e., services)

In the factor markets we distinguish, in this initial version, only labor and capital. And finally, incomes from the factor markets are distributed across four types of families, according to income level.

The model assumes free mobility of factors across sectors. We also assume fixed foreign savings so that adjustments take place in an environment of limited resources. All elasticities of substitution are assumed to be one — i.e., Cobb-Douglas. This general and simple specification tries to capture the long-term fiscal effects without restrictions in the markets and with a limited availability of resources.



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