



Explaining the Increase in Remittances to Mexico

By Jesus Cañas, Roberto Coronado and Pia M. Orrenius

Over the last decade or so, inflation-adjusted remittances have grown at an average annual rate of 15.6 percent. Since 2000, the rate has risen to 20.4 percent.

Mexicans living in the United States sent a record \$23.1 billion back home in 2006, putting remittances third after oil and maquiladora exports as a foreign-exchange generator for Mexico (*Chart 1*). Over the last decade or so, inflation-adjusted remittances have grown at an average annual rate of 15.6 percent. Since 2000, the rate has risen to 20.4 percent.

What's driving the rapid growth of remittances to Mexico? It's a question that has puzzled researchers for years because the most likely economic forces don't seem to be in play. Fundamental factors, such as the size of the Mexican migrant population, their income and the strength of their bonds to Mexico, haven't grown as fast as remittances. Other variables, such as the peso-dollar exchange rate and Mexican economic conditions, have been relatively stable since at least 1996.

What *have* changed are money-trans-

fer costs, which have plummeted since 2000, and Banco de México's measurement techniques. Together, these factors likely account for the bulk of unexplained remittance growth in the last few years.

Destinations and Origins

For Mexico, remittances are an important source of income and stability. In poorer parts of the country, such as the central and southern states, the additional income from family members in the U.S. is crucial to sustaining living standards and propping up local economies.

Banco de México has good data on where remittances go within Mexico (*Table 1*). The central-western states attract most of these financial flows, with Michoacán at the top with almost \$2.5 billion, 16.1 percent of gross state product (GSP). Guanajuato follows at \$2.1 billion (14.8 percent), then Jalisco at \$2 billion (2.4 percent) and Estado

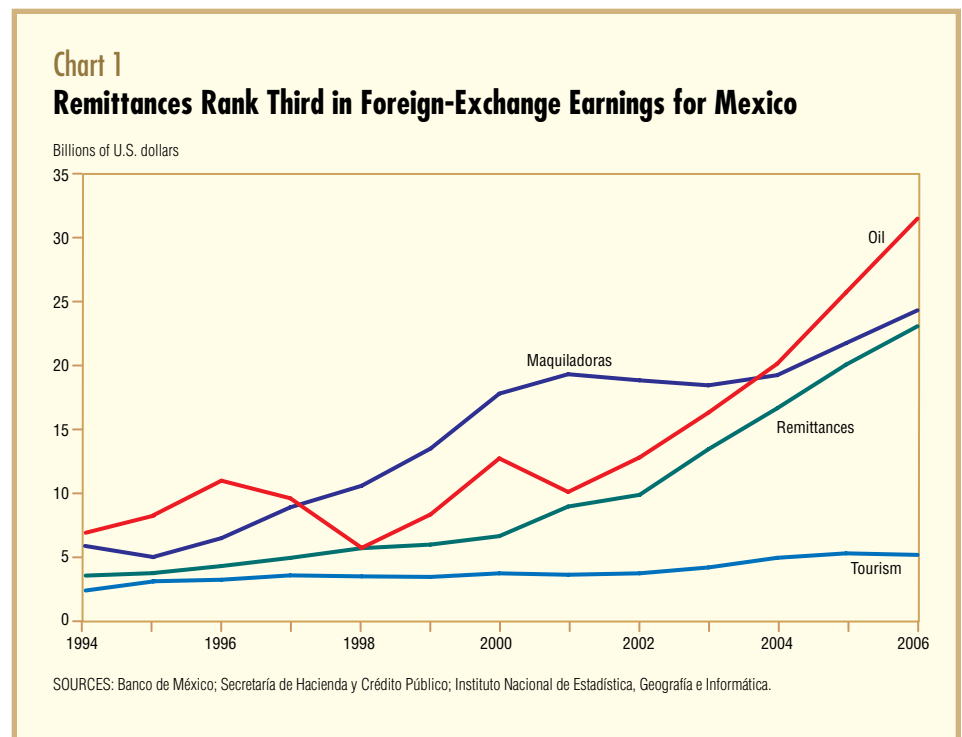


Table 1
Where Remittances Go in Mexico

Rank		Millions of U.S. dollars	Share (percent)	Per capita (dollars)	Share of GSP (percent)
1	Michoacán	2,472	10.7	617	16.1
2	Guanajuato	2,055	8.9	414	14.8
3	Jalisco	1,993	8.6	291	2.4
4	Estado de México	1,926	8.4	135	6.3
5	Distrito Federal	1,551	6.7	176	.7
6	Veracruz	1,415	6.1	196	3.7
7	Puebla	1,386	6.0	253	4.4
8	Oaxaca	1,198	5.2	337	8.6
9	Guerrero	1,157	5.0	367	10.3
10	Hidalgo	853	3.7	358	1.6
11	Chiapas	808	3.5	185	4.8
12	Zacatecas	610	2.6	441	9.1
13	San Luis Potosí	607	2.6	248	3.5
14	Morelos	528	2.3	323	4.7
15	Querétaro	467	2.0	287	3.2
16	Sinaloa	420	1.8	159	2.6
17	Aguascalientes	378	1.6	348	3.9
18	Durango	371	1.6	242	3.4
19	Chihuahua	369	1.6	112	.8
20	Tamaulipas	356	1.5	116	1.2
21	Nayarit	328	1.4	341	7.2
22	Nuevo León	286	1.2	67	.6
23	Tlaxcala	258	1.1	236	5.0
24	Baja California Norte	232	1.0	80	.7
25	Sonora	216	.9	89	.9
26	Coahuila	216	.9	85	.7
27	Colima	167	.7	289	3.9
28	Tabasco	150	.7	74	1.2
29	Yucatán	114	.5	61	.9
30	Quintana Roo	79	.3	67	.7
31	Campeche	63	.3	82	.5
32	Baja California Sur	25	.1	47	.5
	National total	23,054	100	220	2.7

NOTE: All data are 2006, except share of GSP, which is 2004.

SOURCES: Banco de México; Instituto Nacional de Estadística, Geografía e Informática; authors' calculations.

de México at \$1.9 billion (6.3 percent). As a share of GSP, remittances are also significant in Guerrero, Zacatecas, Oaxaca and Nayarit.

In contrast, the northern Mexican border states of Baja California Norte, Sonora, Chihuahua, Nuevo León, Coahuila and Tamaulipas are among recipients with the fewest remittances. Together, they receive less than \$1.7 billion, which represents only 0.9 percent of their joint GSP.

The border states have lower remittances because they're among the wealthiest Mexican states and aren't typically the source of low-skilled migrants to the U.S.

the Latino immigrant population in each state. In Texas, foreign-born Latinos are more likely to be young, unmarried workers from Mexico. They're also more likely to be from Mexican border states and carry money home on return visits—a form of transfer not recorded as remittances in the survey.

In an era when more workers are crossing borders, Mexico's double-digit annual growth in remittances isn't unusual. Looking at real remittances for a group of developing countries from 1994 to 2005, many have growth rates as high as or higher than Mexico's (*Chart 2*). Remittances more than doubled in real terms over this

While Mexico tracks remittances' destinations, we know less about the money's origins within the United States. No state-level data track remittances to Mexico. Texas, as home to a fifth of all Mexican immigrants in the U.S., no doubt accounts for a large share of remittances. We get a sense of that by looking at the Inter-American Development Bank's annual survey of remittances to Latin America, which ranks Texas second with \$5.2 billion in 2006, up 64 percent from 2004 levels (in nominal terms).¹ California leads in remittances to Latin America with \$13.2 billion, and New York is third with \$3.7 billion.

The IADB survey also shows that 47 percent of Latin American adult immigrants residing in Texas regularly send money home, compared with 63 percent in California and 77 percent in New York. These differences probably result from the composition of

period for, among others, India, the Philippines, China, Bangladesh, Poland, Colombia, Guatemala, El Salvador, the Dominican Republic, Nigeria, Ecuador, Indonesia, Sri Lanka and Jamaica.²

Driving Factors

What determines how much money Mexicans send home? Overall, remittances tend to increase when the migrant population rises, its income grows, the peso-dollar exchange rate rises, money-transfer costs fall or economic crisis strikes the home country. As migrants spend more time away from home, their remittances decline, particularly if migrants bring their families to live with them or they form new families in the host country.

These factors have contributed to the rise in remittances since 2000, but even collectively they haven't been dynamic enough to account for the entire increase.

Real remittances grew 170 percent from 2000 to 2005, but in the U.S., the Mexican-born population grew only 20 percent. Estimates indicate Mexican immigration—legal and illegal—actually declined in 2001, 2002 and 2003 as the U.S. economy entered a recession, followed by a rather weak labor market recovery.³ In-migration in 2004 was still well below 2000 levels.

Meanwhile, real median weekly earnings among U.S. Hispanics rose only 18 percent over this period, and the dollar appreciated only 7.4 percent vis-à-vis the peso. The modest change in currency value reflects the Mexican economy's relative stability, with its most recent crisis over a decade ago.

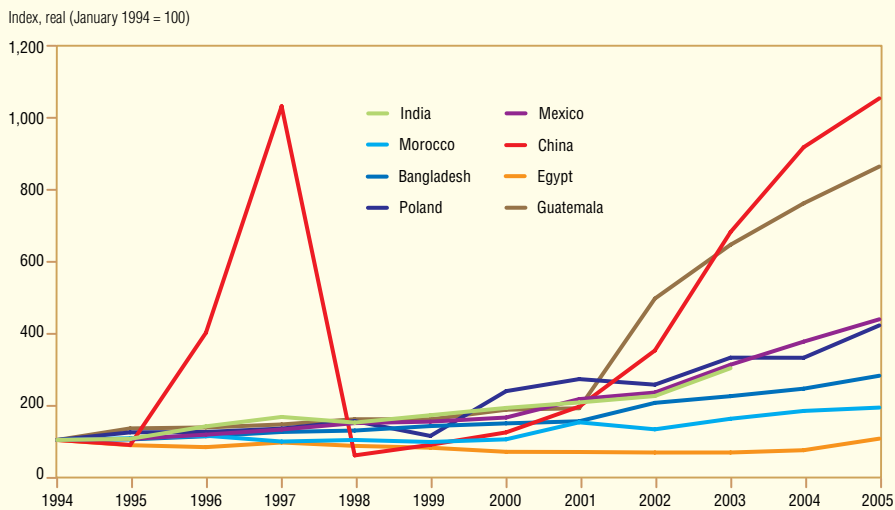
Among the remittance drivers, the biggest change came in the average transaction cost of money transfers, which has fallen more than 50 percent since 2000.⁴

One factor has been greater competition. More than 100 money-transfer organizations served Mexico in 2005, compared with only five in 1995.⁵

Another factor in cutting costs has been technology, including debit and credit cards and such transfer options as the Federal Reserve System's Directo a México automated clearinghouse system. Banco de México estimates that electronic transfers have risen from 53 percent of remittances in 1996 to 85.8 percent in 2003 and 93 percent by 2006.⁶

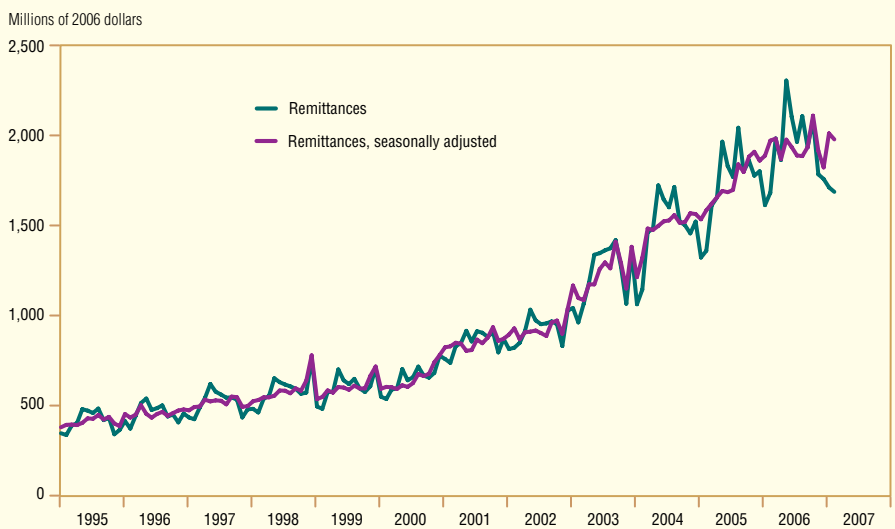
Spurred by declining costs for both senders and receivers, migrants increasingly have been transmitting remittances through

Chart 2
Remittances Rising for Many Countries



NOTE: Data for India are available only through 2003.
SOURCE: International Monetary Fund, International Financial Statistics database.

Chart 3
Measured Remittances Climb Faster Since 2000



SOURCES: Banco de México; authors' calculations.

formal channels rather than informal channels, such as carrying cash back home. Less return migration and increased difficulties crossing the border have also contributed to the growing use of formal channels.⁷

Measuring Remittances

Formal money transfers are easier to keep tabs on, and some of the displacement of informal remittances has been counted as increases in overall transfers. In this way, better measurement has contrib-

uted significantly to the higher remittance growth rate in recent years.

Banco de México overhauled its procedures for collecting and recording remittance data in 2000. Efforts initially focused on recordkeeping within the central bank and then on collection from sources outside the bank.⁸ In October 2002, Banco de México issued rules under which all banks and wire-transfer companies had to register with the central bank and report monthly remittances by Mexican state of destination.

Before 2002, monthly remittance levels were inferred from an outdated 1990 census of financial institutions, money exchange houses and electronic wire-transfer companies. The new census of companies, mandatory reporting and growing formal transfers all led to faster remittance growth.

The result was much improved data collection and a clear break with past trends. Setting aside the 2000–02 transition period, the remittance growth rate appears to have roughly two phases that correspond to Banco de México measurement changes—pre-2000 and post-2002 (*Chart 3*). Remittances' annual average growth rate was 10.3 percent in the first period. It rose to 20.6 percent in the second period, although recent months have seen a slight decline (*see box titled "A Slowdown in 2007"*).⁹

The data also show greater seasonality in 2002–06.

Even with the new and improved measurement techniques, counting informal remittances remains a challenge. Banco de México addresses the underreporting of informal transfers by conducting annual surveys of returning migrants and incorporating estimates of the cash and goods they carry home. However, it's unlikely they've been able to capture such informal transfers with the same precision as the formal ones.

A consequence of the new methodology is a growing discrepancy with other sources of data on Mexican remittances. As calculated by Banco de México, remittance volume and growth are much higher than other measures, including one from the U.S. Department of Commerce's Bureau of Economic Analysis. The BEA estimates that remittances to Mexico were \$10.7 billion in 2005 and \$11.1 billion in 2006. These estimates are roughly half those of Banco de México (*Chart 4*).

The two series track closely until 2000, diverging around the time that Banco de México adopted its new measurement methodology. The BEA and Banco de México, however, have always had very different remittance estimation techniques. The BEA methodology isn't based on direct reporting by banks and other fund transfer companies but on a remittance model built on informed assumptions regarding migrant remittance behavior and estimates of the size and characteristics of the migrant population.¹⁰

In addition to government, or macro, measures of remittances, there are survey-based, or micro, measures of remittances

for senders and receivers.

According to a household survey of Mexican migrants called the Mexican Migration Project (MMP), 79 percent of Mexican workers in the U.S. remit an average of \$350 per month.¹¹ If MMP migrants were representative of all Mexican workers in the U.S., these numbers would be consistent with official remittances of over \$20 billion. However, MMP is overwhelmingly made up of return migrants who, because of their strong ties to the homeland, remit greater sums with higher frequency than average Mexican immigrants.

Recipient-based micro data on remittances also differ from the Banco de México estimates. Looking at a large, nationally representative household survey in Mexico called Encuesta Nacional de Ingresos y Gastos de los Hogares, Gerardo Esquivel and Alejandra Huerta-Pineda find that 1.4 million Mexican households received an average of \$2,560 in remittances in 2002. Based on these figures, remittances totaled \$3.6 billion in 2002, only 37 percent of official estimates for that year.¹²

A Slowdown in 2007

The latest Banco de México data show that growth in remittances has tapered off in recent months—although flows remain at near-record highs.

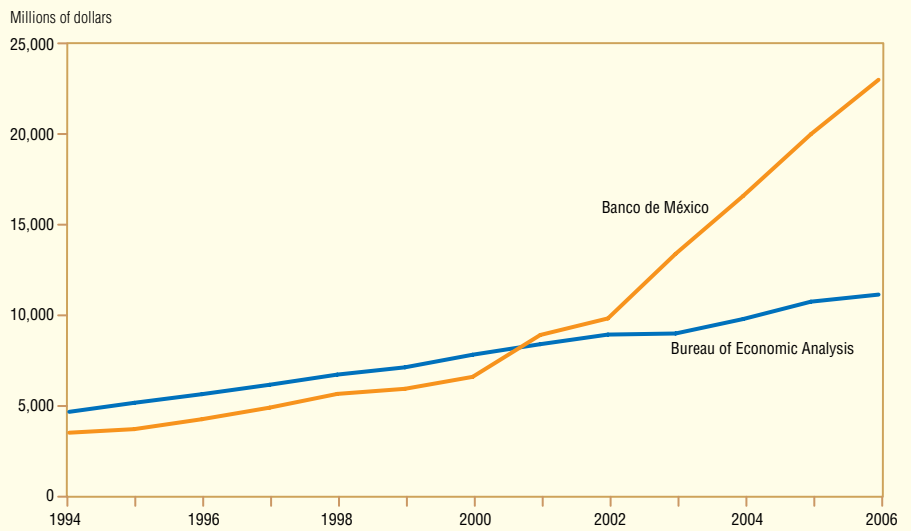
After starting out strongly in 2006, monthly remittances peaked in October 2006 at \$2.1 billion. In the first half of 2007, real remittances were 1.4 percent below flows in the same period of 2006.

Explaining the sudden slowdown is difficult, but statistical models suggest Mexican remittances are strongly related to overall U.S. economic activity. Thus, it's likely that the slowdown is tied to recent U.S. economic deceleration, particularly in sectors such as construction that employ a large number of Mexican immigrants.

As the U.S. economy slows and labor demand ebbs, fewer Mexicans cross the border to seek work. Indirect confirmation can be found in U.S. Border Patrol apprehensions of undocumented migrants, which were down 31 percent in the first quarter of 2007, compared with the same three months of 2006. U.S. gross domestic product growth was also weak in the first quarter, below 1 percent.

As the U.S. economy regains momentum, the flow of workers should pick up and remittance growth should resume.

Chart 4
U.S., Mexico Remittance Data Diverge After 2002



SOURCES: Banco de México; U.S. Department of Commerce.

Some Mexican officials have questioned the discrepancy between the macro and micro data. They claim the Banco de México methodology, designed to capture familial transfers (*remesas familiares*), doesn't do enough to exclude transactions made for illicit business reasons, such as payments to human smugglers or drug traffickers, or legitimate nonfamily transfers, such as donations to nonprofit organizations.¹³

Anecdotal evidence suggests that illicit cross-border money transfers have been increasing over time. In response to heightened monitoring of wire transactions within the U.S., including Arizona, smugglers are reportedly having more of their payments wired to border states on the Mexican side.¹⁴ Nevertheless, the geographic breakdown of remittances within Mexico correlates well with known migration patterns among the population and doesn't show disproportionately large transfers to Mexican border states.

Modeling Remittances

With a host of recent changes to the remittance data, it might be interesting to know what a forecast based on the "old" data would have predicted for post-2002 remittances.

To explore this question, we construct a simple model with several macroeconomic variables, including U.S. and Mexican GDP, the peso-dollar exchange rate, the U.S. Consumer Price Index and maquila-

dora employment.¹⁵ The model generates a forecast by projecting the fitted values of remittances as of fourth quarter 2002.

The model predicts that macroeconomic factors would have led to remittances of \$21.5 billion in 2006 (*Chart 5*). Banco de México reported \$23.1 billion. Our model thus explains 93 percent of the official estimates in 2006. The \$1.5 billion gap is partly due to the new methodology, which increased the growth rate of remittances by incorporating newer, fast-growing firms into the recordkeeping, and to falling transfer costs, which compelled remitters to switch from carrying cash and goods to sending formal transfers.

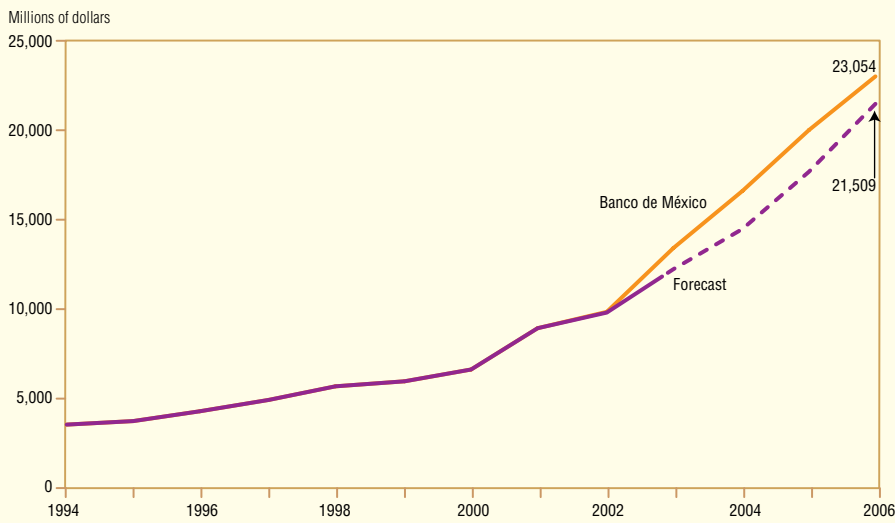
Adding control variables to capture the effect of the post-2002 change suggests the new methodology's impact amounted at most to \$700 million in 2006.¹⁶ Estimates of the cost elasticity of remittances show that cheaper transactions likely boosted 2006 transfers by more than \$1 billion.¹⁷

Our analysis suggests better measurement and falling transfer costs are important factors in recent increases in remittances to Mexico and their faster growth rate in the post-2000 period. Formal transfers are now being measured more accurately, and informal transfers are shrinking as remitters make greater use of formal channels.

Policy Implications

Remittance data worldwide have historically been of poor quality and grossly underestimated migrant transfers for years.

Chart 5
Model Captures Most of Post-2000 Surge in Remittances



SOURCES: Banco de México; authors' calculations.

As we have seen, the Mexican government has taken important steps to address these issues. The benefits of remittances are profound. Studies have shown that migrants' transfers home reduce poverty, increase investment in children's schooling, boost health spending, finance small businesses and increase access to financial services.¹⁸

A global effort to standardize the definition and measurement of remittances is currently under way, led by a group of multinational institutions, including the World Bank and International Monetary Fund. Better data will facilitate cross-country comparisons of remittances.

Efforts to improve data come at a crucial time. As the monies have grown, policymakers have taken greater interest in remittances and their effects.

In host countries, governments are struggling with how to block money flows to terrorist groups or other criminals while permitting legitimate transfers. Other policymakers have decried remittances, suggesting they be discouraged through taxation and senders be subject to more stringent identification and reporting requirements.

In recipient countries, remittances have been tapped to fund public projects, normally paid for by resident taxpayers, and governments have struggled to regulate growth in financial service institutions that typically disburse transfers. As measurement and standardization issues get resolved, the policy issues will dominate future debates over the money migrants send home.

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Notes

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¹ "Sending Money Home: Leveraging the Development Impact of Remittances," Inter-American Development Bank, Multilateral Investment Fund, 2006. See www.iadb.org/news/docs/remittances_EN.pdf.

² Data for India are available only through 2003.

³ "Rise, Peak and Decline: Trends in U.S. Immigration 1992–2004," by Jeffrey Passel and Roberto Suro, Pew Hispanic Center, September 2005.

⁴ "Migraciones y remesas en América Latina y el Caribe: Los flujos intrarregionales y las determinantes macroeconómicas," by Manuel Orozco, Sistema Económico Latinoamericano y del Caribe, May 2006.

⁵ "Development Impact of Remittances," by Yira Mascaró, paper presented at the Federal Reserve Bank of Dallas Cross-Border Banking Conference, San Antonio, May 11, 2007.

⁶ "Improving Central Bank Reporting and Procedures on Remittances," by Jesus Cervantes, paper presented at the Federal Reserve Bank of Dallas Cross-Border Banking Conference, San Antonio, May 11, 2007.

⁷ "Remittances: Transaction Costs, Determinants and Informal Flows," by Caroline Freund and Nikola Spatafora, World Bank Policy Research, Working Paper no. 3704, August 2005.

⁸ Cervantes (2007).

⁹ Average annual growth rates were 16 percent in 2000–02.

¹⁰ Bureau of Economic Analysis estimation has the advantage of being low cost and not excluding transfers made through

informal remittance channels, but it's very sensitive to assumptions made about who is remitting and how much. Also, while BEA defines remittances as those transfers by migrants who have been in the U.S. for at least one year, a General Accountability Office report suggests the BEA model may capture some of those initial transfers after all. In any case, the exclusion is not large enough to make up the difference.

¹¹ "Remittances and Their Microeconomic Impact: Evidence from Latin America," by Catalina Amuedo-Dorantes, in *Migration, Trade, and Development: Proceedings of a Conference Sponsored by the Federal Reserve Bank of Dallas*, James F. Hollifield, Pia M. Orrenius and Thomas Osang, ed., Dallas: Federal Reserve Bank of Dallas, forthcoming.

¹² "Remittances and Poverty in Mexico: A Propensity Score Matching Approach," by Gerardo Esquivel and Alejandra Huerta-Pineda, El Colegio de Mexico, unpublished paper, 2005.

¹³ "Omite BdeM contabilizar remesas no familiares," by Alma E. Muñoz, *La Jornada*, Feb. 13, 2006.

¹⁴ "Human Smugglers Have New Fee System," *Dallas Morning News*, Oct. 14, 2006, p. 2A.

¹⁵ We construct an autoregressive integrated moving average model with quarterly data. We difference the data to ensure stationarity and use cross-correlograms and autocorrelation functions to estimate the lagged structure of each variable and the residuals vis-à-vis remittances. Then we run the model of remittances on its determinants and lagged values of itself, including current and lagged values of independent variables. For more information about transfer function model estimation and forecasting, see *Forecasting With Dynamic Regression Models*, by A. Pankratz, New York: Wiley and Sons, 1991.

¹⁶ To approximate the effect of the change in methodology, we fully interacted the model with a post-change dummy variable that takes the value 1 starting in fourth quarter 2002.

¹⁷ The cost elasticity of remittances is assumed to be -0.4 and is based on estimates in Freund and Spatafora (2005).

¹⁸ "Leveraging Remittances for Development," by Dilip Ratha, in *Migration, Trade, and Development: Proceedings of a Conference Sponsored by the Federal Reserve Bank of Dallas*, James F. Hollifield, Pia M. Orrenius and Thomas Osang, ed., Dallas: Federal Reserve Bank of Dallas, forthcoming.