CDDRL
WORKING PAPERS

Number 112
April 2009

Do Migrants Improve Their Hometowns? Remittances and Access to Public Services in Mexico, 1995-2000

Claire Adida
Stanford University

Desha Girod
Stanford University

Center on Democracy, Development, and The Rule of Law
Freeman Spogli Institute for International Studies

Additional working papers appear on CDDRL's website: http://cddrl.stanford.edu.

Center on Democracy, Development,
and The Rule of Law
Freeman Spogli Institute for International Studies
Stanford University
Encina Hall
Stanford, CA 94305
Phone: 650-724-7197
Fax: 650-724-2996
http://cddrl.stanford.edu/

About the Center on Democracy, Development and the Rule of Law (CDDRL)

CDDRL was founded by a generous grant from the Bill and Flora Hewlett Foundation in October in 2002 as part of the Stanford Institute for International Studies at Stanford University. The Center supports analytic studies, policy relevant research, training and outreach activities to assist developing countries in the design and implementation of policies to foster growth, democracy, and the rule of law.

Do Migrants Improve Their Hometowns?

Remittances and Access to Public Services in Mexico, 1995-2000

Claire L. Adida Desha M. Girod†
Stanford University

Forthcoming *Comparative Political Studies*

Abstract

How do citizens in developing countries access public services? Scholars study this question by emphasizing the role of government, measuring government performance as household access to public services, such as clean water and sanitation. However, we argue that the state does not hold a monopoly on provision of such utilities: citizens in developing countries often turn to non-state providers for basic utilities. In Mexico, we find that direct money transfers from migrants, known as remittances, are used to provide household access to public services. Our statistical analysis across Mexico's 2,438 municipalities demonstrates that citizens improve their own access. Our results also contribute new evidence to the literature on remittances and development by offering a micro-level explanation for how remittances impact both the availability and the source of basic utilities. Our findings suggest that the measures scholars typically associate with government performance may in fact capture non-state provision of basic utilities.

Keywords: migration, development, public goods, Mexico

† Claire Adida is a Ph.D. candidate in the department of political science at Stanford University and a Hewlett pre-doctoral fellow at the Center for Democracy, Development and the Rule of Law, 616 Serra Street, Stanford University, Stanford CA 94305-6055; phone: 650-724-5555; fax: 650-724-2996; email: cadida@stanford.edu.

Desha Girod is a post-doctoral fellow at the Center for Democracy, Development and the Rule of Law, 616 Serra Street, Stanford University, Stanford CA 94305-6055; phone: 650-799-3388; fax: 650-724-2996; email: dgirod@stanford.edu.

The authors would like to thank the Center on Democracy, Development and the Rule of Law at Stanford University for funding support. The authors would also like to thank Sarah Anderson, Luz Marina Arias, Rikhil Bavnani, Matthew Cleary, Alberto Diaz-Cayeros, Jim Fearon, Stephen Krasner, David Laitin, Beatriz Magaloni, Alejandro Poiré, Michael Tomz, and participants in seminars at Stanford University, the 2008 Annual Meeting of the American Political Science Association, and the 2006 Annual Meeting of the Midwest Political Science Association for their helpful feedback.

1. Introduction

How do citizens in developing countries access public services? Access to basic utilities has become a popular measure of good governance among social scientists (Adserà, Boix, & Payne, 2003; La Porta et al., 1999). In particular, scholars of Mexico evaluate government performance by measuring citizen access to water, sanitation and electricity. Hiskey (2003) analyzes access to these three utilities as a measure of government accountability in two Mexican states, Michoacan and Jalisco. Diaz Cayeros, Estevez, & Magaloni (forthcoming) also analyze access to water and sanitation to study the impact of social service programs. Cleary (2007) evaluates improvements in water and sanitation access across Mexican municipal governments to study the impact of civic participation on government performance. However, governments are not the sole providers of basic utilities. Non-state providers, including non-governmental organizations (NGOs), for-profit organizations, and even revolutionary movements, have been offering access to water and drainage throughout the developing world in places as diverse as Bangladesh, India, South Africa, Kenya, and Ethiopia.[1]

We ask whether migrants, by sending money back to their communities, also facilitate "non-state provision" of basic utilities. Migrants have been sending money to their hometowns for decades.[2] Since the mid-1990s, these direct money transfers, known as remittances, skyrocketed worldwide. In 2006, remittances globally totaled $204 billion, double the amount of development assistance, and 62 percent more than in 2004 (World Bank, 2007; World Bank, 2005). Remittances sometimes exceed *combined* official development assistance and foreign direct investment (Inter-American Development Bank, 2006). In 2005, remittances constituted 13 percent of GDP in the Philippines, nearly 20 percent of GDP in El Salvador, Jamaica, Honduras, Nicaragua and Haiti, 10 percent in the Dominican Republic, Guatemala, Belize and

Bolivia, and, in Mexico and Colombia, 3 and 5 percent respectively.[3] Remittances therefore represent a substantial influx of income to developing countries. In fact, they even surpass government spending in some localities. In the Mexican state of Guanajuato, which received $652.30 million in remittances in 1996, more than any other Mexican state that year, remittance income was 14 times greater than federal social spending (Zarate-Hoyos, 2004, pp. 556-7).

These large monetary flows and their potential impact on development and social outcomes have not escaped attention. For decades, scholars have been investigating the impact of remittances on economic development.[4] Initially, scholars were skeptical of any positive long-term development impact of these flows and argued that remittances, at worst, increased recipients' dependency on a foreign source of income.[5] At best, recipients only used them toward consumption, such as home construction, food, clothing, cars, and so forth.[6] More recently, Durand, Parrado & Massey (1996) argue that remittances could positively impact development despite being spent on consumption because they support local markets, and because migrants might also invest them in productive activities, such as purchasing farm equipment or investing in local manufacturers. Consistent with Durand, Parrado & Massey (1996), research finds that remittances contribute to productive activities and social well-being in both cross-national and country-specific studies, ranging from Mexico and Central America to Turkey, Jordan, Egypt, Pakistan, India, the Philippines and even Somaliland. Their results suggest that remittances increase investment, reduce poverty, improve school enrollment, reduce illiteracy, and reduce infant mortality.[7]

Most relevant for our analysis, researchers have found through primarily qualitative studies that remittances develop local infrastructure, especially projects typically associated with governmental service provision, such as road improvements or drainage systems. For example,

Mexican migrant organizations in the United States, known as Hometown Associations (HTAs), pool remittances, through dances, raffles and so forth, explicitly to fund these types of services (Orozco & Lapointe, 2004; Leiken, 2000). The evidence from Mexico shows that pooled remittances fund everything from church improvements to road pavement, water systems, meeting halls, health clinics, and parks.[8] This phenomenon extends beyond Mexico. Chaudhry (1989) reports that in Yemen in the 1970s, "[a]part from guaranteeing the financial independence of the private sector, remittances generate local resources that enable rural communities to suspend reliance on the state for the provision of basic infrastructure, such as roads, electricity, water, clinics and schools" (Chaudhry, 1989, p. 115). With remittance income, migrants and non-migrants become "non-state providers" of public services.

Our article offers statistical evidence that remittances fund household access to basic utilities. We disaggregate data on household access to clean water and drainage from the Mexican Census to measure whether and how households access these utilities. We then test how non-migrants spend remittances to improve their social well-being by separating out improvements in infrastructure that citizens are likely to build for themselves (household-driven methods of access) from infrastructure provided by the government (government-driven methods of access). We find that remittances empower households to develop technology to access public utilities.

Our findings call into question whether aggregate measures of access to public services used in existing work on government accountability in Mexico and beyond adequately capture government performance. The literature assumes that access to public services means access provided by the government and measures access without unpacking the technology linking households to public infrastructure. However, governments can "provide" public services to

households either directly through public infrastructure or indirectly because households themselves compensate for insufficient government infrastructure. Disaggregating households' method of access allows us to unpack the technology linking households and public provision. By uncovering determinants of household-driven and government-driven access to public utilities, we demonstrate that aggregate measures obfuscate the complex infrastructure of access.

Moreover, our results reveal that these public services are not "public goods", as the literature tends to claim (see, for example, Diaz-Cayeros, Estevez, & Magaloni, forthcoming; Habyarimana et al., 2007).[9] By definition, public goods are non-excludable and non-rivalrous. Access to water would represent access to a public good, for example, if the government could not exclude anyone from obtaining water and one citizen's access would not limit another's. However, if access to water depends on households' technology of access, then water is an excludable good and therefore not a public good.

In what follows, we offer a micro-level explanation for how non-migrants use remittances to improve access to clean water and sanitation. In the third section, we test empirically whether remittances improve access to public services through private means of access by analyzing the impact of remittances on access to drainage and clean water across Mexican municipalities between 1995 and 2000. We find that remittances positively affect changes in household-driven access as well as changes at the aggregate level, suggesting that migrants are important "non-state providers" of basic utilities and that aggregate improvements in coverage are driven in part by increases in household-driven methods of access.

2. Why remittances might improve access to public services

The literature on remittances and development demonstrates that remittances fuel economic development because recipients stimulate local markets by spending their income on consumption and because non-migrants invest small amounts of their remittances in local productive activities. This research, however, has yet to isolate the link between remittances and access to basic utilities.[10] We offer a micro-level explanation for how remittances promote access to clean water and sanitation.

We focus on clean water and sanitation for three reasons. First, recent studies on governmental accountability in Mexico explain variation in governmental provision of these two services. By investigating the impact of remittances on household access to clean water and sanitation, our study engages with leading scholarship on government performance in Mexico.

Second, the lack of clean water and sanitation constitute important attributes of poverty and explaining variation in their provision could improve our understanding of how non-governmental institutions affect community well-being. Dirty water kills two million people worldwide annually through diseases like diarrhea.[11] Since individuals become sick by drinking or touching water that touched waste, the combination of dirty water and poor drainage is lethal (Kremer, Miguel, & Zwane, 2006). As Fry, Mihelcic, & Watkins (2008) report, efforts that improve both water and sanitation systems are best at reducing the incidence of waterborne illness. Explaining household access to clean water and drainage systems, therefore, is critical to explaining health and sanitation in a community.

Third, remittances *can* finance household needs like clean water and drainage. The literature indicates that non-migrants spend an important fraction of their remittance income on home construction and improvements (Durand & Massey, 2004). The impact of remittances on basic infrastructure is therefore more likely to manifest itself through household improvements

than through improvements in roads, schools or parks, which scholars also cite as services funded by remittance income. Even if such data existed at the sub-national level, the impact of family remittances would likely be smaller and more difficult to detect.[12]

How do we expect remittances to improve access to clean water and sanitation? Cross-national surveys show that non-migrants consume much of the remittance money they receive. In Mexico, they consume as much as 90 percent of their remittances on home improvements and basic necessities, like food, medicine, or clothing.[13] According to Parrado (2004), Mexican households with greater links to the United States are "more likely to have tile or wooden floors (as opposed to dirt). They also tend to be larger, with four or five rooms instead of 1 to 3 and to have more appliances..." (Parrado, 2004, p. 73).

Although the literature demonstrates that non-migrants spend remittances on home improvements, analyses so far have focused on bigger houses, more rooms and better materials. These improvements could also include the building of infrastructure for access to clean water and sanitation. In other words, remittances could impact the well-being of communities if they empower citizens to access cleaner water and better sanitation systems.

Households in Mexico access clean water mainly through indoor pipes or a communal tap. They eliminate sewerage mainly by draining it into septic tanks, the public sewerage system, bodies of water, or by dumping it on public lands.[14] We refer to these methods of access *as household-driven, government-driven,* or driven by a *combination of both*, based on household and government contributions to the technology of access to these utilities. Access is household-driven if households contribute all or part of the infrastructure used to access the utility. It is government-driven if households do not contribute any infrastructure to access the utility, and use existing government infrastructure instead.[15] When the government offers some of the

infrastructure and households complement it with their own technology, access depends on both the government and citizens.

Among these common methods of access to water and drainage in Mexico, only one method excludes government involvement altogether and is therefore entirely household driven. Citizens obtain access to sewerage without government involvement if they purchase septic tanks. When citizens use septic tanks, the government provides no infrastructure for the disposal of the household sewerage.

The analogous technology to septic tanks for water is wells, but few citizens use wells because wells have been drying up.[16] Instead, households invest in their own access to water by building pipes that connect their homes to the public system. Similarly, citizens can connect indoor pipes to the public sewerage system to complement government provision of sanitation. We consider these methods of access as complementary to government provision because the municipal government is responsible for the public system of water and sewerage pipes, including protection from floods and management of treatment plants. But for households to access water or sewerage from the public system, they need to build their own pipes.

A third mode of access is when public utilities are entirely provided by government infrastructure. In Mexico, access to water is entirely government-driven when citizens access water through communal taps. Households that utilize this method of access do not invest in infrastructure to bring water into their homes. They use existing infrastructure provided by the government. There is no parallel method in drainage.

In sum, access to sanitation is either entirely household-driven (septic tanks) or driven by a combination of household and government provision (connections to the public sewerage system). Access to water is either entirely government-driven (common taps) or driven by a

combination of household and government provision (connections to the public water system). We expect that the additional household income from remittances improves household-driven access or access that complements government infrastructure. For access to sanitation, this means purchasing a septic tank or connecting to the municipal system of public pipes. For access to clean water in one's home, this means connecting to the municipal system of public pipes.[17]

Additionally, we investigate whether the effect of remittances is observed on aggregate indicators of access to water and sanitation. Such an effect would suggest that remittances prompt greater household-driven access or increase complementary access where both government and citizens invest in improvements in the provision of public utilities. In either case, an effect of remittances on aggregate measures of access would indicate that remittances significantly empower households to improve their access to clean water and sanitation.

Although we expect a positive relationship between remittances and access to services that improve communal well-being, remittances could instead have no effect, or even a negative effect, on access to these utilities. Remittances could decrease access to water and sanitation because their appeal induces mass migration.[18] In this case, remittances would be creating ghost towns where citizens and governments lack incentives to invest in local infrastructure.[19]

In sum, remittances could either positively or negatively affect access to basic household needs. We argue that they are likely to improve access because citizens use remittances to develop the infrastructure privately in their homes.

3. Empirical Analysis

We evaluate the impact of remittances on access to utilities in hometown communities by estimating a model that explains the change in access to clean water and sanitation between 1995

and 2000 across Mexico's 2,438 municipalities. We test a linear model using robust standard errors to correct for heteroskedasticity.

Mexico offers a propitious opportunity for analyzing the effect of remittances on household needs and public services. First, Mexico's National Council on Population (CONAPO) provides state and municipal-level survey data on the proportion of households receiving remittances in 2000. Furthermore, CONAPO provides state and municipal-level data on the proportion of households that, between 1995 and 2000, had an emigrant in the United States. This measure is highly correlated with remittances at both the state level (r=0.95) and the municipality level (r=0.83) in 2000, and therefore allows us to analyze the impact of remittances over a five-year period.

We use this measure of emigration as a proxy for remittances in this article, similar to Diaz-Cayeros, Magaloni & Weingast (2003), for two reasons.[20] First, this variable measures emigration *between* 1995 and 2000, and not just in 2000. Given that we are estimating a change in access between 1995 and 2000, we need an indicator that spans the same time period, rather than a measure that covers only 2000. Furthermore, by estimating a change in access from 1995 to 2000 with an indicator of remittances between 1995 and 2000, we avoid biasing our results with endogeneity. Change in access from 1995 to 2000 may affect the flow of remittances in 2000, but it cannot drive the flow of remittances (emigration) between 1995 and 2000.

Second, Mexico's federalist system allows for sub-national empirical analyses at either the state or the municipal level. By sampling all Mexican municipalities, this analysis examines a cross-section of units within the same country that received different levels of remittance flows between 1995 and 2000. The most recent literature on government performance in Mexico uses a similar research design to exploit variations between sub-national entities while maintaining

country-level factors constant (Cleary, 2007; Diaz-Cayeros, Estevez & Magaloni, forthcoming). These studies use municipal governments as their unit of analysis instead of state governments because Mexico's more than 2,000 municipalities constitute a large sample size. Furthermore, Mexico's Constitution calls on municipal governments to provide local public utilities.

Our analysis consists of twelve causal variables including our proxy for remittances. The dependent variables, *Septic* and *IndoorDrainage*, and *IndoorWater* represent respectively the change between 1995 and 2000 in household access to drainage through a septic tank, household access to drainage through indoor pipes, and household access to clean water through indoor pipes. These methods of access require private investment: if remittances empower households to improve their own technologies of access, we would observe this effect on household access to sanitation through septic tanks or indoor drainage, and to clean water through indoor pipes. Table 1 disaggregates access to water and drainage into their census categories for 1995 and 2000 and presents summary statistics for each category. It indicates that, between 1995 and 2000, the proportion of households accessing drainage through a septic tank increased by close to one percentage point, the proportion of households accessing drainage through indoor pipes increased by nearly three percentage points, and the proportion of households accessing clean water through indoor pipes increased by close to five percentage points.

[TABLE 1 HERE]

We transform our dependent variables into first-differences because improvements in access, rather than levels of access, account for both initial conditions as well as other omitted variables. For example, any given level of coverage reflects a host of previous decisions made at the household level and at the government level (Diaz Cayeros, Estevez & Magaloni, forthcoming). We therefore follow Diaz Cayeros, Estevez & Magaloni (forthcoming), Diaz-

Cayeros & Magaloni (2003) and Hiskey (2003) by estimating variations in change in coverage, rather than level of coverage.[21] Also following Diaz Cayeros, Estevez & Magaloni (forthcoming), we transform the dependent variables into differences in the log likelihood ratios to avoid making unrealistic predictions from a linear model.

The model controls for economic, political and social factors.[22] First, we account for a municipality's socio-economic development with a measure of change in the proportion of the population that is literate between 1995 and 2000. This control is particularly important for the time period analyzed because Mexico experienced an economic crisis in 1995 and different localities may have recovered at different paces (Hiskey, 2005). Ideally, we would control for changes in a municipality's per capita gross domestic product. However, the census does not offer data at the municipal level for 1995.[23] Instead, we use literacy rates, one of the components of the Human Development Index, as a measure of development. If wealthier municipalities enjoy better access to basic household needs, we expect that increases in literacy rates, or *Literate*, will positively impact the change in household access to clean water through indoor pipes and to drainage through septic tanks and indoor pipes.

We also control for two indicators of democratic institutions to account for the possibility that more democratic municipalities enjoy greater access to drainage and clean water because they hold their governments more accountable. For example, Hiskey (2003) argues that greater electoral competitiveness increases rates of coverage. Cleary (2007) argues that greater voter turnout positively affects rates of coverage. We control for the former with *PRIShare*, which captures the difference in vote share for the ruling *Institutional Revolutionary Party* (PRI) between local elections in the mid-1990s and local elections in the late-1990s: the greater the vote share, the greater the PRI monopoly, the less competitive the municipal election.[24] We

control for the latter with *Turnout*, which captures the difference in voter turnout between local elections in the mid-1990s and local elections in the late-1990s. If better democratic institutions improve government performance and responsiveness, and thus the coverage of public utilities, we expect *PRIShare* to negatively affect access to public utilities and *Turnout* to positively affect access to public utilities.[25]

Third, we account for a municipality's financial capacity by controlling for government spending and transfers. *PublicExpenditures* measures the difference between 1995 and 2000 in per capita municipal government spending on public works and services. *FISM* (Social Development Municipal Funds) measures the change in financial transfers from central to municipal government under the national Solidarity program launched in the late 1980s.[26] Furthermore, we include dummy variables for the three main political parties in Mexico. Some scholars argue that the dominant PRI used financial transfers to reward municipalities that supported it and to punish municipalities that opposed it during elections (Diaz Cayeros, Estevez & Magaloni, forthcoming; Magaloni, 2006). Yet others have found instead that opposition municipalities benefited from campaign pork from a central government attempting to buy their political support (Weldon & Molinar, 1994).[27] We control for both effects with party dummies that take the value "1" if the municipality was controlled by, respectively, the *PRI*, the *National Action Party* (*PAN*), or the *Party of the Democratic Revolution* (*PRD*) for at least six years during the 1990s, and zero otherwise.

Fourth, we account for social determinants of coverage in basic household needs using a measure of demographic change and a measure for the presence of indigenous populations. *Population* measures the change in a municipality's population between 1995 and 2000, and captures the demographic pressure for coverage during that time period. If demographic

pressures outweigh the rate of coverage, population growth should negatively affect access to basic utilities. We further control for the presence of indigenous populations with *Indigenous*, a dummy variable that takes the value "1" if more than 50 percent of the municipality's population speaks an indigenous language and zero otherwise. Scholars of Mexico have used indicators of indigenous populations to control for poverty as well as for the possibility that a community's indigenous character might facilitate access to utilities through greater collective action. If *Indigenous* captures poverty levels, we expect this variable to negatively affect coverage. If, however, *Indigenous* captures the tightness of a community, we expect this variable to positively affect coverage.[28]

Fifth, we include the initial level of the household access to the utility to account for the fact that a percentage-point increase in access may be easier when a municipality has a lower baseline level of coverage because localities might catch up to one another socio-economically over time. We therefore control for a conditional convergence effect (Diaz Cayeros, Estevez, & Magaloni forthcoming). If it exists, municipalities with higher initial rates of coverage will experience less change in coverage in the five years we study.[29]

Finally, we perform three robustness checks to verify the consistency of our results. First, we add state-fixed effects to account for state-specific factors that we may not capture with our controls or observe otherwise. For example, some state governments are more involved in the provision of clean water for their municipalities than others (World Bank, 2005). The second test accounts for the influence of outliers using Hadi's method for identifying multiple outliers in multivariate data (Hadi, 1994). Models that study the impact of remittances are particularly vulnerable to outliers since remittances tend to concentrate geographically in a few states (Zarate-Hoyos 2004, p. 557). Finally, we perform all of our tests again on *levels* of access rather

than *changes* in access. Since our measure of remittances, which is the proportion of households with an emigrant in the United States between 1995 and 2000, is a level rather than a change, an alternative specification of the model might assess the impact of remittance levels between 1995 and 2000 on the *level* of coverage in 2000.[30]

[TABLES 2 AND 3 HERE]

Tables 2 and 3, Models (1) through (8) present results from estimations of the variation in the change in household access to drainage through septic tanks (Table 2, Models 1 through 4), through indoor piping (Table 2, Models 5 through 8), and the variation in the change in household access to clean water through indoor piping (Table 3, Models 1 through 8). Tables 2 and 3 indicate that those municipalities with more remittances between 1995 and 2000 experience larger improvements in household access to drainage through a septic tank and in household access to clean water through indoor pipes. The impact of remittances on these methods of access is robust to alternative model specifications and to the presence of outliers and state-fixed effects. However, remittances have no significant effect on improvements in household access to drainage through indoor pipes, suggesting that the impact of remittances on general household access to drainage occurs largely through septic tanks, the more household-driven of the two methods of access. In sum, consistent with the literature on remittances, recipients of remittances spend their income on home improvements, which includes access to basic household needs, like clean water and drainage (figures 1a and 1b).[31]

[FIGURE 1 HERE]

The results in Tables 2 and 3 further indicate that improvements in development levels, captured through *Literate*, positively affect household-driven access to utilities. The significant impacts of FISM and political allegiance vary with the type of utility, an interesting result

beyond the scope of this article. Finally, Tables 2 and 3 indicate that conditional convergence occurs: municipalities with higher initial levels of coverage improve less.[32] [33]

The analysis so far suggests that remittances increase households' private access to drainage and clean water controlling for economic, political and social variables. When remittance-recipients improve their homes, they invest in utilities that promote their health, which may have positive externalities on the community at large. But to what extent does improvement in households' technology of access drive aggregate access in a municipality? In order to investigate the breadth of remittances' effect, we estimate a model that analyzes the impact of remittances on improvements in access to the *aggregate* indicators for drainage and clean water. Approximately 40 percent of household access to drainage occurs through septic tanks and about one-third of household access to clean water occurs through indoor pipes. More importantly, this type of access increases as a proportion of all sanitation and clean water coverage between 1995 and 2000, suggesting that the impact of remittances on these methods of access may also drive changes in the aggregate measures.

We test this claim by estimating the change between 1995 and 2000 in aggregate household access to drainage and in aggregate household access to clean water. We use the same model, include the same controls, and perform the same robustness checks as our initial estimations. Our results indicate that those municipalities receiving more remittances between 1995 and 2000 experience larger improvements in aggregate access to drainage. We find, however, no significant impact of remittances on improvements in clean water coverage between 1995 and 2000. The interpretation of the result on drainage is straightforward: remittances increase aggregate household access to drainage because more households turn to septic tanks for their drainage when remittances increase.

Why do we not see the same improvement with water? We investigate this result by estimating the variation in access to clean water through a communal tap, for which the government is the sole provider. Although access to clean water through communal taps actually decreased from 62 percent in 1995 to 55 percent in 2000, it nonetheless constitutes nearly two-thirds of all access to clean water. We follow the same model, include the same controls and perform the same robustness checks from our original estimations.

Our results indicate that remittances have a significant *negative* effect on improvements in household access to clean water through a communal tap between 1995 and 2000. This effect is significant in six of the eight specifications (and in 22 of our 24 alternative specification tests), and is interesting for two reasons. First, it explains the non-finding on the aggregate measure of household access to clean water: if remittances are associated with increases in access to clean water through indoor pipes but with decreases in access to clean water through a communal tap (the two most common methods of household access to clean water), then the effect of remittances on the aggregate variable should be null. Second, the findings on indoor pipes and communal taps suggest a possible substitution effect between the two methods. The data we present are consistent with a story of remittances financing a transition from household access to clean water from a standpipe in a shared compound, to household access to clean water privately, through pipes within the home.[34]

In sum, at an aggregate level, remittances positively affect access to drainage because they raise household-driven access to septic tanks, and households increasingly turn to septic tanks for access to sanitation. However, remittances have no significant effect on access to clean water because they divert access away from purely government-driven access toward a method of access where government and households both contribute to the provision of clean water.

Migrants, therefore, not only fund access to water and sanitation, but also change the way these utilities are accessed in Mexican municipalities.

4. Conclusion

We disaggregated municipal-level data on access to clean water and sanitation to test systematically the effect of remittances on the well-being of Mexican households. We build on the literature on the development impact of remittances by providing evidence of a micro-level mechanism between remittances and factors that improve health. Municipalities that receive more remittances improve their household-driven technologies of access to clean water and drainage. Moreover, because households play an increasing role in building their own technology of access, we demonstrate that the breadth of remittances' impact on the well-being of hometown communities is significant and increasing.

Our results further indicate that political and social effects on coverage are sensitive to the type of utility as well as to the method of access. For example, public expenditures through municipal government spending and through FISM have a positive effect on clean water coverage, but a more complicated impact on sanitation, depending on the method of access to drainage. These divergent results suggest that access to basic household needs involves strategies that vary with the type of utility. Disaggregated analyses, like the one in this article, can yield a greater understanding of the strategies used by local governments, migrants and minorities for improving the well-being of hometown communities.

Disaggregated analyses can also advance existing studies of government performance that assume the government is the sole or primary provider of access to basic utilities. If improvements in access to water and drainage reflect citizen action more than governmental

action, then analyses of aggregate access to water and sanitation may inadequately measure government performance. They may instead be capturing a dynamic between state and non-state providers of utilities. Our findings therefore raise a critical question for future research: if remittances empower households to gain their own access to clean water and sanitation, do they provide a disincentive for governments to deliver these public services? Our results on access to drainage indicate that this may be the case. On the other hand, our results on access to clean water suggest that household and government contributions may complement one another. Future research should address how remittances influence government accountability by developing a model of how government behavior changes as remittances increase. This research can take advantage of the recent expansion of the Mexican government's partnership with migrants through its matching program, *Tres por Uno*, where the federal, state and municipal governments match remittances pooled by migrants in the United States.[35] Remittances pooled in the United States and formally delivered to Mexico constitute only a small proportion, $14.2 million out of a total $20.5 billion in 2004, of known remittance flows.[36] Nevertheless, analyzing whether remittances substitute or complement governance is a promising avenue for future research.

References

Adams, Jr., R. H. (1998). Remittances, Investment, and Rural Asset Accumulation in Pakistan. *Economic Development and Cultural Change, 47(1),* 155-173.

Adams, Jr., R. H. and J. Page. (2005). Do International Migration and Remittances Reduce Poverty in Developing Countries? *World Development, 33(10),* 1645–69.

Adserá, A., Boix, C. and M. Payne. (2003). Are You Being Served? Political Accountability and Quality of Government. *The Journal of Law, Economics, & Organization 19(2)*, 445-490.

Ahmed, I. (2002). Remittances and Their Economic Impact in Post-war Somaliland. *Disasters, 24(4),* 380-89.

Alarcon, R. (2002). The Development of Hometown Associations in the United States and the use of social remittances in Mexico. Unpublished dissertation, Department of Social Studies, El Colegio de la Frontera Norte, Tijuana, Mexico.

Cerstin, S. and S. M. Maimbo. (2005). Migrant Remittances in Africa: A Regional Perspective. In S.M. Maimbo and D. Ratha (Eds.), *Remittances: Development Impact and Future Prospects*. Washington, D.C.: The World Bank.

Chaudhry, K. A. (1989). The Price of Wealth: Business and State in Labor Remittances and Oil Economies. *International Organization, 43(1),* 101-45.

Chimhowu, A. O., J. Piesse, and C. Pinder. (2005). The Socioeconomic Impact of Remittances on Poverty Reduction. In S.M. Maimbo and D. Ratha (Eds.), *Remittances: Development Impact and Future Prospects*. Washington, D.C.: The World Bank.

Cleary, M. R. (2007). Electoral Competition, Participation, and Government Performance in Mexico. *American Journal of Political Science. 51(2),* 283-299.

Cohen, J. H. (2005). Remittance Outcomes and Migration: Theoretical Contests, Real

Opportunities. *Studies in Comparative International Development, 40(1),* 88-112.

Cohen, J. H. and L Rodriguez. (2005). Remittance Outcomes in Rural Oaxaca, Mexico: Challenges, Options and Opportunities for Migrant Households. *Population, Space and Place, 11,* 49-63.

Cox, A. and M. Ureta. (2003). International Migration, Remittances, and Schooling: Evidence From El Salvador. NBER Working Paper 9766.

Diaz-Cayeros, A., F. Estevez and B. Magaloni. Forthcoming. *Strategies Of Vote Buying: Poverty, Democracy and Social Transfers in Mexico*. Cambridge: Cambridge University Press.

Diaz-Cayeros, A., B. Magaloni, and B. Weingast. (2003). Tragic Brilliance: Equilibrium Hegemony and Democratization in Mexico. Working Paper, Stanford University.

Durand, J. and D.S. Massey. (2004). In J. Durand and D.S. Massey (Eds), *Crossing the Border*. New York: Russell Sage Foundation.

Durand, J., E. A. Parrado, and D. S. Massey. (1996). Migradollars and Development: A Reconsideration of the Mexican Case. *International Migration Review, 30(2),* 423-44.

Durand, J. and D. S. Massey. (1992). Mexican Migration to the United States: A Critical Review *Latin American Research Review, 27(2),* 3-42.

Frank, R. and R. A. Hummer. (2002).The Other Side of the Paradox: The Risk of Low Birth Weight Among Infants of Migrant and Nonmigrant Households Within Mexico. *International Migration Review, 36(3),* 746-65.

Fry, L.M., J. R. Mihelcic, and D.W. Watkins. (2008). Water and Non water-related Challenges of achieving Global Sanitation Coverage. *Environ. Sci. Techno, 42,* 4298–4304.

Goldring, L. (2002). The Mexican State and Transmigrant Organizations: Negotiating the

Boundaries of Membership and Participation. *Latin American Research Review, 37(3),* 55-99.

Goldring, L. (1998). From Market Membership to Transnational Citizenship? The Changing Politization of Transnational Spaces. *L'Ordinaire Latino-Americain. No. 173-174,* 167-172.

Governance and Social Development Resource Center. (August 2008). Service Delivery. Available at: http://www.gsdrc.org/go/topic-guides/service-delivery/non-state-providers.

Habyarimana, J., M. Humphreys, D. N. Posner and J. M. Weinstein. 2007. Why does Ethnic Diversity Undermine Public Goods Provision? *American Political Science Review 101(4),* 709-725.

Hadi, A. S. (1994). A Modification of a Method for the Detection of Outliers in Multivariate Samples. *Journal of the Royal Statistical Society, 56(2),* 393-396.

Hildebrandt, N. and D.J. McKenzie. (2005). The Effects of Migration on Child Health in Mexico. *Economia, (Fall),* 257-284.

Hiskey, J. (2005). The Political Economy of Subnational Economic Recovery in Mexico. *Latin American Research Review, 40(1),* 30-55.

Hiskey, J. (2003). Demand Based Development and Local Electoral Environments in Mexico. *Comparative Politics, 36(1),* 41-60.

Inter-American Development Bank. (2006). Remittances 2005: Promoting Financial Democracy. Washington, DC: Inter-American Development Bank.

Kapur, D. (2003). Remittances: The New Development Mantra? Paper prepared for the G-24 Technical Group Meeting, Geneva.

King, G, M. Tomz and J.Wittenberg. (2000). Making the Most of Statistical Analyses:

Improving Interpretation and Presentation. *American Journal of Political Science*, *44(2),* 347-361.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny. (1999). The Quality of Government. *Journal of Law, Economics, and Organization 15(1),* 222.279.

Leiken, R. (2000). *The Melting Border: Mexico and Mexican Communities in the United States*. Washington, D.C. Center for Equal Opportunity.

Lipton, M. (1980). Migration from Rural Areas of Poor Countries: The Impact on Rural Productivity and Income Distribution. *World Development, (8),* 1-24.

Lopez, F. H., L, Escala-Rabadan, R, Hinojosa-Ojeda. (2001). Migrant Associations, Remittances, and Regional Development Between Los Angeles and Oaxaca, Mexico. North American Integration and Development Center, *Research Report Series, No. 10*.

Lopez-Cordova, E. (2006). Globalization, Migration and Development: The Role of Mexican Migrant Remittances. Inter-American Development Bank Working Paper 20.

Lopez-Cordova, E. and A. Olmedo. (2006). International Remittances and Development: Existing Evidence, Policies and Recommendations. Inter-American Development Bank INTAL-ITD Occasional Paper 41.

Lucas, R. E. B., O. Stark. (1985). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy, 93(5),* 901-918.

Magaloni, B. (2006). *Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico.* Cambridge: Cambridge University Press.

McKenzie, D. J. (2006). Beyond Remittances: The Effects of Migration on Mexican Households in Ozden, C. and M. Schiff (Eds.), *International Migration, Remittances and the Brain Drain*. Washington, D.C.: The World Bank and Palgrave MacMillan.

Mines, R. (1981). *Developing a community tradition of migration: A Field Study in Rural Zacatecas, Mexico and California Settlement Areas*. University of California, San Diego: Program in United States-Mexican Studies.

Mooney, M. (2004). Migrants' Social Capital and Investing Remittances in Mexico. In J. Durand and D. S. Massey (Eds.), *Crossing the Border*. New York: Russell Sage Foundation.

Orozco, M. and M. Lapointe. (2004). Mexican Hometown Associations and Development Opportunities. *Journal of International Affairs, 57(2)*.

Ozden, C. and M. Schiff. (2006). *International Migration, Remittances and the Brain Drain*. Washington, D.C.: The World Bank and Palgrave MacMillan.

Parrado, E. A. (2004). U.S. Migration, Home Ownership, and Housing Quality. In J. Durand and D.S. Massey (Eds.) *Crossing the Border*. New York: Russell Sage Foundation.

Programa de las Naciones Unidas para el Desarollo. (2007). *Informe Sobre Desarollo Humano Mexico 2006-2007: Migracion y Desarollo Humano*. Programa de las Naciones Unidas para el Desarollo : Mexico, D.F.

Rapoport, H. (2005). The Economics of Migrants' Remittances. IZA Disc. Paper No. 1531.

Riding, A. Mexico's Count of Migrants in the U.S. is lower than others. (1980, October 13). *The New York Times*, p. A3. Available at: http://www.nytimes.com

Russell, S. S. (1992). Migrant Remittances and Development. *International Migration, 30(3-4),* 267-287.

Thompson, G. Mexico's Migrants Profit from Dollars Sent Home. (2005, February 13). *The New York Times,* p. A10. Available at: http://www.nytimes.com

United Nations. NGO Major Group Discussion Paper on Water, Sanitation and Human

Settlements. Retrieved August 15, 2008. Available at: http://www.unngls.org/cso/NGOWater.doc

Water Aid. Retrieved August 15, 2008. Available at: http://www.wateraid.org/

Weldon, J. and J. Molinar Horcasitas. (1994). Electoral Determinants of National Solidarity. In W. Cornelius, A. Craig & J. Fox (Eds), *Transforming State Society Relations in Mexico: The National Solidarity Strategy*. La Jolla: UCSD, Center for US-Mexican Studies.

Wong, M. (2006). The Gendered Politics of Remittances in Ghanaian Transnational Families. *Economic Geography 82, (4)*, 355-382.

Woodruff, C. and R. Zenteno. (2001). Remittances and Microenterprises in Mexico. UCSD, Graduate School of International Relations and Pacific Studies, Working Paper.

World Bank. (2005). *Global Development Finance: Mobilizing Finance and Managing Vulnerability*. Washington D.C.: The World Bank.

World Bank. (2006a). Philippines: Recent Economic Developments. Retrieved August 1, 2007. Available at: http://siteresources.worldbank.org/

World Bank. (2006b). *Global Economic Prospects: Economic Implications of Remittances and Migration*. Washington D.C.: The World Bank.

World Bank. (2007). Migration and Remittances. Retrieved August 1, 2007. Available at: http://web.worldbank.org/

Zarate-Hoyos, G. A. (2004). Consumption and Remittances in Migrant Households: Towards a productive use of remittances. *Contemporary Economic Policy 22, (4),* 555-65.

Table 1: Summary statistics for access to household needs (%)

		1995 Conteo		2000 Censo		
Dependent Variables		Mean	SD	Mean	SD	Mean Change
Access to drain		45.35	30.14	49.30	28.76	4.23
	Septic tank	14.23	15.93	14.97	14.98	0.79
	Indoor drainage system	27.05	28.06	29.72	28.73	2.91
	Drain into body of water	1.25	2.76	1.58	3.20	0.32
	Drain into body of land	2.82	5.18	3.03	4.99	0.21
Access to drain not specified[37]		54.42	30.14	47.89	28.62	6.53
Access to clean water		75.02	21.98	76.41	19.99	1.64
	Indoor pipes	26.68	25.78	31.03	25.00	4.58
	Standpipe in compound	45.44	24.02	40.76	21.69	-4.68
	Public standpipe	2.90	7.42	4.62	6.92	1.74
Access to clean water not specified		0.09	0.14	N/A	N/A	N/A
No access to clean water		24.66	21.94	N/A	N/A	N/A
Access to water from a neighbor		N/A	N/A	2.64	1.91	N/A
Access to water from a truck		N/A	N/A	0.95	2.81	N/A
Access to water from a body of water		N/A	N/A	17.19	19.5	N/A

Independent Variables	Mean	St. Deviation	N
Proportion of households with an emigrant in the U.S. between 1995 and 2000 (%)	6.34	6.84	2443
Change in literacy, 1995 to 2000 (%)	1.80	3.20	2411
Change in turnout, mid-90s to late-90s (%)	5.38	10.55	1920
Change in per capita public expenditures, 1995 to 2000 (pesos)	352.59	389.48	2095
Change in per capita FISM expenditures, 1996 to 2000 (pesos)	78.1	231.28	2387
Change in PRI vote share, mid-90s to late-90s (%)	-6.18	15.01	1943
Change in population, 1995 to 2000	3140.89	13236.38	2387
PRI dummy (%)	91.81	27.43	1953
PRD dummy (%)	6.91	25.37	1953
PAN dummy (%)	8.24	27.51	1953
Percent indigenous language, 1995	13.60	34.29	1816

Table 2: Change in household access to drainage through septic tanks and through indoor drainage, 1995-2000

	Septic Tanks: OLS				Indoor Drainage: OLS			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittances	0.005	0.021***	0.023***	0.008*	0.004	0.003	0.003	0.003
	(0.004)	(0.005)	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
Literate	6.252***	6.295***	6.498***	6.535***	-2.659^	-1.337	-1.335	-2.674^
	(1.455)	(1.473)	(1.476)	(1.461)	(1.368)	(1.282)	(1.280)	(1.368)
Turnout	-0.119	-0.233	-0.170	-0.001	0.240	0.391^	0.382^	0.219
	(0.225)	(0.257)	(0.260)	(0.228)	(0.195)	(0.201)	(0.201)	(0.195)
PRI Share	0.107	0.135	0.142	0.132	0.378**	0.188	0.186	0.375**
	(0.152)	(0.192)	(0.193)	(0.154)	(0.129)	(0.157)	(0.157)	(0.129)
Public Expenditures	0.0002**	0.0003***	0.0003***	0.0002**	-0.00004	-0.00008^	-0.00008^	-0.00004
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FISM	0.0004*	0.0007***	0.0007***	0.0004*	-0.0002	0.00003	0.00004	-0.0002
	(0.0001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PRI Dummy	-0.128	-0.114	-0.091	-0.116	0.037	-0.019	-0.023	0.034
	(0.100)	(0.103)	(0.104)	(0.100)	(0.063)	(0.067)	(0.067)	(0.063)
PRD Dummy	-0.504***	-0.181^	-0.159	-0.495***	-0.002	0.094	0.090	-0.006
	(0.102)	(0.111)	(0.111)	(0.102)	(0.064)	(0.068)	(0.068)	(0.064)
PAN Dummy	-0.347***	-0.194*	-0.254**	-0.434***	0.073	0.041	0.046	0.085^
	(0.079)	(0.080)	(0.081)	(0.080)	(0.049)	(0.050)	(0.050)	(0.049)
Population	-7.7e-6***	-7.3e-6***			1.6e-6*	1.1e-6		
	(1.43e-6)	(1.3e-6)			(6.4e-7)	(9.5e-7)		
Indigenous	0.093	-0.037	-0.016	0.122	0.035	-0.014	-0.014	0.035
	(0.098)	(0.110)	(0.111)	(0.099)	(0.095)	(0.096)	(0.095)	(0.095)
1995 Level of	-2.076***	-2.476***	-2.427***	-2.023***	-1.023***	-0.927***	-0.907***	-0.998***
Access to the Utility	(0.164)	(0.179)	(0.177)	(0.161)	(0.090)	(0.096)	(0.092)	(0.087)
Constant	0.507***	0.375**	0.280*	0.425***	0.694***	0.673***	0.677***	0.699***
	(0.119)	(0.121)	(0.121)	(0.119)	(0.086)	(0.095)	(0.095)	(0.086)
State fixed effects	No	Yes	Yes	No	No	Yes	Yes	No
R^2	0.215			0.201	0.136			0.135
Observations	1586	1586	1586	1586	1497	1497	1497	1497

Robust standard errors in parentheses. Statistical significance: ^ $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

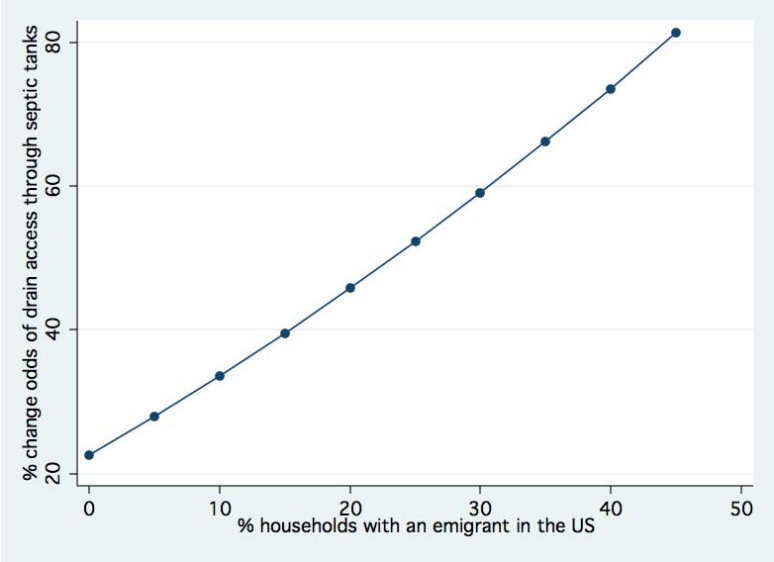
Table 3: Change in household access to clean water through indoor pipes, 1995-2000

	OLS				OLS Without Outliers			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Remittances	0.012***	0.007*	0.006^	0.011***	0.009**	0.006^	0.007*	0.009**
	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Literate	1.695	2.590*	2.621*	1.69	0.315	0.985	1.615^	0.834
	(1.071)	(1.074)	(1.076)	(1.071)	(0.993)	(1.003)	(0.899)	(0.901)
Turnout	0.218	0.092	0.060	0.188	0.392*	0.306	0.235	0.338*
	(0.167)	(0.184)	(0.184)	(0.167)	(0.179)	(0.208)	(0.190)	(0.164)
PRI Share	0.112	-0.096	-0.104	0.102	0.171^	0.057	0.036	0.157^
	(0.099)	(0.123)	(0.123)	(0.099)	(0.101)	(0.121)	(0.113)	(0.093)
Public Expenditures	0.00005	-2.5e-6	-0.00001	0.00004	5.87e-6	-0.00003	-0.00005	-0.00001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
FISM	-0.0003**	-0.0004***	-0.0004**	-0.0003**	-0.0004***	-0.0006***	-0.0006***	-0.0004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PRI Dummy	-0.030	-0.034	-0.046	-0.035	0.119	0.041	0.041	0.132
	(0.065)	(0.067)	(0.067)	(0.065)	(0.096)	(0.086)	(0.088)	(0.098)
PRD Dummy	0.159*	0.196**	0.186*	0.156*	0.384*	0.368***	dropped	dropped
	(0.073)	(0.077)	(0.076)	(0.073)	(0.173)	(0.092)		
PAN Dummy	0.113*	0.132*	0.152**	0.135*	dropped	dropped	0.08	0.139***
	(0.056)	(0.055)	(0.055)	(0.055)			(0.051)	(0.026)
Population	2.6e-6***	3.6e-6***			5.7e-6	0.00001*		
	(6.9e-7)	(8.2e-7)			(4.01e-6)	(4.9e-6)		
Indigenous	0.010	0.049	0.048	0.007	-0.053	-0.005	0.004	-0.056
	(0.074)	(0.075	(0.075)	(0.074)	(0.060)	(0.063)	(0.062)	(0.060)
1995 Level of	-1.406***	-1.606***	-1.534***	-1.370***	-1.322***	-1.564***	-1.368***	-1.232***
Access to the Utility	(0.077)	(0.094)	(0.091)	(0.075)	(0.076)	(0.106)	(0.092)	(0.072)
Constant	0.698***	0.783***	0.796***	0.710***	0.566***	0.722***	0.681***	0.537***
	(0.079)	(0.087)	(0.087)	(0.080)	(0.102)	(0.100)	(0.100)	(0.103)
State fixed effects	No	Yes	Yes	No	No	Yes	Yes	No
R^2	0.251			0.248	0.248			0.253
Observations	1597	1597	1597	1597	1232	1232		1270

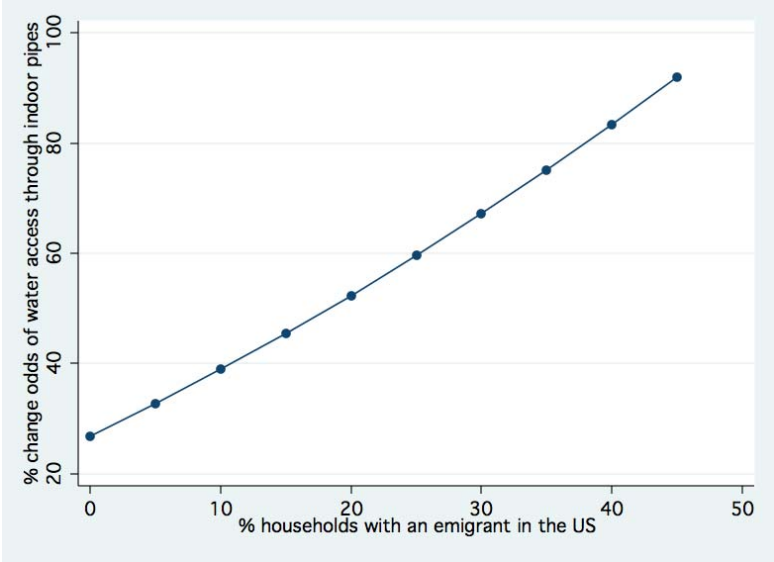
Robust standard errors in parentheses. Statistical significance: ^ $p \leq 0.10$; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

Figure 1: Household driven access to utilities between 1995 and 2000

(1a) Household access to drainage through a septic tank 1995 to 2000



(1b) Household access to water through indoor pipes 1995 to 2000



[1] See "NGO Major Group Discussion Paper on Water, Sanitation and Human Settlements." Retrieved August 15, 2008, from, http://www.un-ngls.org/cso/NGOWater.doc. See also Water Aid. Retrieved August 15, 2008, from, at: http://www.wateraid.org/. See also "Service Delivery." Retrieved August 15, 2008, from, http://www.gsdrc.org/go/topic-guides/service-delivery/non-state-providers.

[2] On remittances to Mexico, see The New York Times (1980). On remittances to Africa, see Cerstin & Munzele Maimbo (2005).

[3] See World Bank (2006a) and Inter-American Development Bank (2006).

[4] See World Bank (2006b); Lipton (1980); Mines (1981); Russell (1992); Ozden & Schiff (2006); Cohen & Rodriguez (2005); Zarate-Hoyos (2004); Woodruff & Zenteno (2001); Ahmed (2000); and Adams (1998).

[5] See Cohen (2005) for a review.

[6] See Durand & Massey (2004); Russell (1992); Mines (1981); Lipton (1980); For a review, see Durand & Massey (1992).

[7] For examples of remittances' impact on productive activities, see Endnote 6. See Cox & Ureta (2003) on their impact on school enrollment; see Lopez-Cordova (2006) on their impact on illiteracy, and, on their impact on infant mortality, see Hildebrandt & McKenzie (2005) and Frank & Hummer (2002). For a review of remittances' impact on development, see Lopez-Cordova & Olmedo (2006), and see also, Ozden & Schiff (2006); Lopez-Cordova (2006); Hildebrandt & McKenzie (2005); Adams & Page (2005); Chimhowu, Piesse, & Pinder (2005); Cohen & Rodriguez (2005); Cox & Ureta (2003); Frank & Hummer (2002); Ahmed (2002); Adams (1998); and Woodruff & Zenteno (2001).

[8] See Orozco & Lapointe (2004); Alarcon (2002); Goldring (2002); and Leiken (2000).

[9] We thank an anonymous reviewer for this insight.

[10] Hildebrandt & McKenzie (2005) propose that migration reduces infant mortality by increasing remittances and migrants' knowledge about health. They find that migration increases knowledge about health, but they do not test the mechanism linking remittance income to food and health needs. Our study builds upon their work.

[11] See Kremer, Miguel, and Zwane (2006).

[12] When migrants pool remittances in hometown associations and fund parks, roads, and so forth, they directly provide public infrastructure. In contrast, migrants sending remittances to their households are empowering non-migrants to provide access to public infrastructure for themselves. We refer to migrants as providers in both cases.

[13] See Cohen (2005) for a review and Durand & Massey (2004).

[14] We draw information on the methods and costs of access to water and sanitation from interviews with CONAGUA's Hydraulic Specialist for the Management of Research and Projects on Water and Sanitation: March 4, 2009 and March 27, 2009.

[15] Access to water and sanitation could also be NGO-driven. However, there is little evidence that this occurs on a large scale in Mexico.

[16] Interview with CONAGUA's Hydraulic Specialist for the Management of Research and Projects on Water and Sanitation: March 27, 2009.

[17] Some scholars argue that remittances encourage lavish spending on consumption for social status (Lipton, 1980). Alternatively, migrants could leave their hometowns to improve their own livelihoods as well as those of their families and communities back home, and migrants could use migrant networks to monitor how recipients spend the remittances they send. For reviews of

motivations, see Chimhowu (2005); Rapoport (2005); Mooney (2004). See also Wong (2006) for a study of transnational relationships between migrants and remittance recipients. Using evidence from Botswana, Lucas & Stark (1985, p. 92) report that migrants give out of "enlightened self-interest" or "tempered altruism," meaning that migrants give because it maximizes the household income of which they are still part (even if living abroad), or because they hope to return "with dignity."

[18] Kapur (2003) and McKenzie (2006) find that remittances sponsor further migration.

[19] Additionally, the positive relationship between remittances and access to utilities might be subject to an alternative explanation: if remittances create ghost towns, citizens who stay behind in Mexico may move into the better homes of those who left. We account for the ghost-town effect by controlling for changes in population.

[20] Diaz-Cayeros, Magaloni & Weingast argue that the percentage of people residing in the U.S. is closely correlated with capital flows in the form of remittances sent by migrant workers back home (Diaz-Cayeros, Magaloni & Weingast, 2003, p. 27).

[21] By using a first-difference model, we also allay concerns of spatial correlation.

[22] Some of these variables, namely government spending on public works, may have no impact on access to septic tanks, which is purely household-driven. However, we include these controls in all our models to insure our results are consistent with findings in the literature on government performance in Mexico.

[23] Rosas constructed a municipal-level GDP variable for Mexican municipalities. However, these data are available only for 1990 and 2000.

[24] Cleary (2007) demonstrates that PRI vote share closely tracks the margin of victory (Cleary 2007, p. 290). He considers both to be measures of electoral competitiveness.

[25] Variables such as PRIShare and Turnout, which are drawn from official electoral returns, may be susceptible to fraud through ballot-stuffing. This problem, however, is likely to be more salient in the early 1990s than in the second half of the decade when the PRI was more entrenched. These variables nevertheless remain viable indicators of competitiveness because, as Cleary argues, "a lopsided vote, fraudulent or not, indicates a noncompetitive election" (Cleary 2007, p. 287).

[26] These data are for 1996, the year the new FISM program began, to 2000. Some municipalities accounted for FISM expenditures as public works expenditures in the first years of the FISM program, creating a possible double accounting in the data. Although the correlation between these two variables is low, at –0.2, we ran the regressions with only Public Expenditures on the right hand side and the results survive. Excluding FISM also allows us to avoid potential endogeneity between the FISM measure and our dependent variables (see Diaz Cayeros, Estevez, & Magaloni, forthcoming).

[27] We thank an anonymous reviewer for pointing out that the bias could also reward opposition municipalities.

[28] We have no priors for how this variable might affect coverage empirically. Cleary (2007) finds a negative effect while Diaz Cayeros, Estevez, & Magaloni (forthcoming) find no effect.

[29] *Septic, Indoor, Literate* (retrieved May 26, 2008); *PublicExpenditures, Septic95, Indoor95* (retrieved May 8, 2008); *Population* (retrieved May 20, 2008) come from the Mexican 1995 mid-Census and 2000 Census, available from http:///www.inegi.gob.mx. *FISM* comes from Diaz-Cayeros, Estevez and Magaloni (forthcoming). *Turnout, PRIShare, PRI, PRD, PAN, Indigenous* come from Cleary (2007). *Remittances* comes from the Council on National Population (Retrieved May 23, 2008) at http://www.conapo.gob.mx.

[30] Whether we specify a change-on-change, level-on-level, or change-on-level model, our results hold. Results are available upon request.

[31] We calculated values on the dependent variables for different values of *Remittances* using *Clarify* and holding all other control variables at their mean or median. We then transformed the values on the dependent variables back to odds-ratios. The values on the vertical axis are therefore percent changes, between 1995 and 2000, in the odds of accessing drainage through a septic tank (1a) or clean water through indoor pipes (1b).

[32] We also specified a model with a squared *Indigenous* variable to test whether the impact of an indigenous presence in a municipality might be curvilinear. We find that this curvilinear effect exists only for access to sanitation through septic tanks: municipalities with very low and very high proportions of indigenous populations see lower access to sanitation through septic tanks. Furthermore, this specification does not change our main results on remittances.

[33] Although there are 2,438 municipalities in Mexico, our sample sizes range from 1,232 to 1,597. Similar to Cleary's analysis, we exclude a number of municipalities because they are missing data on some of our control variables, including public finance, electoral and indigenous population variables. When we estimate the full model with robust standard errors, state fixed effects and imputed data, our results hold.

[34] The disaggregated water and drainage variables on which we performed our regressions add up to the aggregate measures of household access to clean water and sanitation, meaning that the equations we estimate may not be independent of one another. To control for the possibility that the errors may be correlated across each regression, we estimate a Seemingly Unrelated Regression model. We find that our results hold for water and weaken for drainage.

[35] The program was initially launched in 1993, but limited to Zacatecas between 1995 and 1999. In 1999, the program was re-launched nationally (Goldring, 1998).

[36] See The New York Times (2005).

[37] This represents the sum of two variables from the Mexican Census: households that did not specify access to drain (0.09 percent in 1995 and 0.36 percent in 2000) and households with no access to drain (54.34 percent in 1995 and 47.53 percent in 2000).