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College of Business
Department of Economics, Applied Statistics, and International Business

March 28, 2023

Dear *REStat* Fellowship Selection Committee,

I am writing to apply for the 2023 *REStat* Fellowship for NBER Summer Institute. I am an assistant professor of economics at New Mexico State University. In the sections below, you will find my personal information and a summary of my current research. I have also attached my CV and a recent paper.

Personal information

Name: Jose R. Bucheli

Email: jbucheli@nmsu.edu

Current affiliation: New Mexico State University

Date of Ph.D.: May 2019

Personal website: www.jrbucheli.com

Summer Institute session of most interest: Labor studies; public economics; education; development economics

Summary of current research: My research lies at the intersection of migration, labor, and minorities' well-being, with two main focus areas. The first area examines the effect of return migration on economic development in countries of origin, with a particular focus on the case of Mexico. My work, which has been recently accepted for publication at *REStat*,[1] shows that the contributions of migrants continue even after their experiences abroad conclude. By shedding light on how return migration shapes economic growth at home, my research adds to our understanding of labor mobility and development.

My second line of inquiry studies how US immigration policies impact migrants and US-born Hispanics. In this work, I find that restrictive border policies can increase unauthorized flows, as migrants face longer waits and increased despair, and that interior immigration enforcement harms Hispanic students' academic progression, even among the US-born. In another study, I find that intensified immigration enforcement suppresses Hispanics' representation in congressional elections, providing an example of how current public policy harms the inclusion and representation of diverse populations.

My ongoing projects expand my research agenda into the socioeconomic and labor effects of policies aimed at protecting immigrant and minority students, as well as the implications of return migration for inequality in home countries. In one of these projects, I study the academic effects of school policies that shield students and their families from immigration enforcement. This work contributes to the study of migration by examining whether and how local jurisdictions can mediate between coercive immigration enforcement efforts and students' academic achievement. Ultimately, my goal is to inform public policy and advance the protection of minority students, particularly Hispanic children, who overwhelmingly suffer the consequences of immigration policies.

[1] "The Impact of Return Migration on Economic Development." Available at: https://doi.org/10.1162/rest_a_01273

José R. Bucheli (March 2023)

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Academic Appointments	**Assistant Professor of Economics** New Mexico State University	2019-Present
Other Appointments	**Consultant** Inter-American Development Bank	2019-2020
	Visiting Research Fellow, University of California, San Diego Center for U.S.-Mexican Studies, School for Global Policy and Strategy	2018-2019
Education	**Ph.D. in Economics** *(with distinction)*, University of New Mexico	2019
	M.A. in Economics, University of New Mexico	2012
	B.A. in Economics, University of New Mexico	2010

Peer-Reviewed Research

1. **Bucheli, J. R.**, M. Fontenla. (Forthcoming) The Impact of Return Migration on Economic Development. *The Review of Economics and Statistics*. Available as SSRN Working Paper No. 4142733.
2. Amuedo-Dorantes, Catalina, **J. R. Bucheli**. (Forthcoming) Immigration Policy and Hispanic Representation in National Elections. *Journal of Policy Analysis and Management*. Available as IZA Discussion Paper No. 13598.
3. Amuedo-Dorantes, Catalina, **J. R. Bucheli**. (2023) Implications of Restrictive Asylum Policies: Evidence from Metering along the U.S.-Mexico Border *Journal of Population Economics*.
4. Amuedo-Dorantes, Catalina, **J. R. Bucheli**, A. Martinez-Donate. (2022) Safe-zone Schools and the Academic Performance of Children in Mixed-Status Households: Evidence from the 'Between the Lines' Study. *Migration Studies*.
5. Amuedo-Dorantes, Catalina, **J. R. Bucheli**, A. Martinez-Donate. (2022) Parental Deportation, Safe-Zone Schools, and the Socio-Emotional and Behavioral Health of Children Left Behind. *AEA Papers and Proceedings 112*, 396–401.
6. **Bucheli, J. R.**, J. Rubalcaba, E. Vargas. (2021) Out of the Class and Into the Shadows: Immigration Enforcement and Education Among US-Citizen and Foreign-Born Hispanics. *AERA Open 7(1)*.
7. Amuedo-Dorantes, Catalina, **J. R. Bucheli**. (2020) A Look Ahead at the 2020 Elections: How Important is Diversity in the Candidate Pool? *AEA Papers and Proceedings 110*, 436–441.
8. **Bucheli, J. R.**, M. Fontenla, B. Waddell. (2019) Return Migration and Violence. *World Development 116*, 113–124

9. **Bucheli, J. R.**, A. K. Bohara, M. Fontenla (2018). Mixed Effects of Remittances on Child Education. *IZA Journal of Development and Migration 8(1)*, 1–18.
10. **Bucheli, J. R.**, A. K. Bohara, K. Villa (2018). Paths to Development? Rural Roads and Multidimensional Poverty in the Hills and Plains of Nepal. *Journal of International Development 30(3)*, 430-456.
11. Ehrhart, M. D., I.R. Guthrie, **J. R. Bucheli**, M. R. Burge (2018). What is the role of race and ethnicity in the development of thionamide-induced neutropenia? *Journal of Endocrinology and Thyroid Research 3(1)*, 1-5.
12. **Bucheli, J. R.**, A. Manshad, M. D. Ehrhart, J. Camacho, M. R. Burge (2017). Association of passive and active smoking with pre-diabetes risk in a predominantly Hispanic population. *Journal of Investigative Medicine 65*, 328-332.

Book Chapters

1. Amuedo-Dorantes, Catalina, **J. R. Bucheli**, A. Martinez-Donate. (2022) Safe-Zone Schools and Children with Undocumented Parents. In *Parent-Child Separation*, 3–28. Springer.

Work Under Review and in Progress

1. "Family Separation and Reunification under President Trump's Zero Tolerance Policy" (with Catalina Amuedo-Dorantes), *accepted*
2. "Government Strategies to Expedite Family Reunification of Unaccompanied Children" (with Catalina Amuedo-Dorantes and Mary Lopez), *under review*
3. "Immigration Enforcement and Labor Supply: Hispanic Youth in Mixed-Status Families" (with Joaquin Rubalcaba and Camila Morales), available as a Center for Growth and Opportunity working paper, *revisions requested*.
4. "The Effects of Return Migration on Financial Inclusion in Mexico" (with Matias Fontenla), *working paper* and available as IDB Discussion Paper No. IDB-DP-812.
5. "Return Migration and Inequality in Mexico" (with Daniel Clayton and Matias Fontenla), *working paper*.
6. "Return Migration and Children's Education: The USA-Mexico Case" (with Avinandan Chakraborty and Matias Fontenla), *working paper*.
7. "Impact of Minimum Wage Changes on the Demand for Foreign Workers" (with Sie Won Kim).

Conference, Professional Presentations

Association for Public Policy Analysis and Management Conference Nov 2022
Presentation 1: "Government Strategies to Expedite Family Reunification of Unaccompanied Migrant Children"
Presentation 2: "The Paradoxical Implications of Restrictive Asylum Policies"

ASSA Annual Meeting Jan 2022
Presentation: "Parental Deportation, Safe Zone Schools, and the Socio-Emotional and Behavioral Health of Children Left Behind"

Southern Economic Association Annual Meeting Nov 2021
Presentation: "Family Separation and President Trump's 'Zero-Tolerance' Policy"

Diversity Initiative for Tenure in Economics (DITE) August 2021
Presentation: "Out of the Class and Into the Shadows: Immigration Enforcement and Education among US-Citizen and Foreign-Born Hispanics"

Population Association of America Annual Meeting May 2021
Presentation: "Safe-Zone Schools and the Schooling of Children in Mixed-Status Households"

ASSA Annual Meeting Jan 2021
Presentation: "The Effect of Immigration Enforcement on Labor Supply: An Examination of United States Hispanic Adolescent Youth in Mixed-Status Families"

Southern Economic Association Annual Meeting Nov 2020
Presentation: "Parental Deportation, Safe Zone Schools, and the Educational Outcomes of Children Left Behind"

Inter-American Development Bank Aug 2020
Presentation: "Return Migration and Financial Inclusion in Mexico"

Western Social Science Association Annual Conference Apr 2020
Presentation: "Diversity in the Candidate Pool and Electoral Engagement"

ASSA Annual Meeting Jan 2020
Presentation: "A Look Ahead at the 2020 Elections: How Important is Diversity in the Candidate Pool?"

Inter-American Development Bank Dec 2019
Presentation: "The Effects of Return Migration on Financial Inclusion in Mexico"

UCSD Center for US-Mexican Studies Seminar Series Jan 2019
Presentation: "Return migration and Economic Development: Evidence from Mexico"

Southwestern Society of Economists Annual Meeting 2018
Presentation: "Return Migration and Social Lag in Mexico"

International Economic Association World Congress 2017
Presentation: "International Remittances and Child Education in Ecuador"

Southwestern Social Science Association Annual Meeting 2017
Presentation: "Wealth, Gender, and Rural vs. Urban Inequalities: The Effect of Remittances and Children's Education in Ecuador"

Agricultural and Applied Economics Association Annual Meeting 2016
Presentation: "The Impact of a Rural Road Development Project on Multidimensional Poverty in Nepal"

Western Social Science Association Annual Conference 2014
Presentation 1: "Social Networks, Remittances, and Child Schooling in Nepal"
Presentation 2: "Multidimensional Poverty Index and Small-Area Estimation for Nepal"

Awards & Fellowships

- **Diversity Initiative for Tenure in Economics (DITE)**, 2020-2021
  Samuel DuBois Cook Center on Social Equity at Duke University
- **Outstanding Emerging Scholar Award**, 2020
  Western Social Science Association
- **Summer Institute in Migration Research Methods**, 2018
  Berkeley Interdisciplinary Migration Initiative, UC Berkeley
- **J. S. Duncan Scholarship in Latin American Economics**, 2018-2019
  Department of Economics, University of New Mexico

- **Doctoral Conference Presentation Award**, 2016
  Office of Graduate Studies, University of New Mexico
- **Ph.D. Fellowship**, 2015-2017
  Latin American & Iberian Institute, University of New Mexico
- **Gerald Boyle Memorial Graduate Student Award**, 2014
  Department of Economics, University of New Mexico
- **Latino Fellowship**, 2013
  Graduate Resource Center, University of New Mexico

Accepted at the Review of Economics and Statistics

The Impact of Return Migration on Economic Development*

José R. Bucheli Matías Fontenla†

Abstract

The Mexican migration flow to the United States—one of the largest in human history—inverted in the late 2000s, and during the next decade more Mexicans returned home than those who migrated north. We exploit this historical reversal to estimate the effects of return migration on economic development in Mexico. We find that return migration leads to higher levels of development through improved income, labor, health, and educational outcomes. Our findings suggest that the benefits of migration extend beyond individuals' tenure abroad, as capital, skills, and social norms acquired abroad have the potential to contribute to development back home.

Keywords: Return Migration, Migration, Economic Development, Mexico, Latin America.

JEL Classification: F22, O15, O19

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"Mexican immigrants to the United States suffered bitter humiliations and hardships, but the country played the role of a giant university in which one million compatriots of the uneducated classes learned to strengthen their character (...), to meet their material needs, to save a minimum amount of ten million pesos annually, and to reveal themselves as a powerful auxiliary in the education of the people."

Manuel Gamio (1935)

1. Introduction

International migration is often thought of as a one-way movement from origin to destination countries. However, many migrants' experiences involve returning home as part of their original plans, with approximately 40% of migrants in the U.S. returning within ten years of arrival (Akee and Jones, 2019). Not taking this feature into account may limit our view of migration as a development tool, as it assumes that migrants only affect their home countries by moving away—i.e., via brain drain and remittances. Additional channels may have the potential to promote economic development, such as when return migrants bring back their savings, human capital, and social norms acquired abroad. Further, these flows may benefit not just the migrants' families but also improve the well-being of their communities.

Almost a century ago, Mexican scholar Manuel Gamio compared migration to the United States to attending a "giant university" where individuals could learn about modern and more efficient agricultural and industrial methods and then use this knowledge to promote development back home (Gamio, 1935). Since then, migration from Mexico to the United States doubled every decade and created one of the longest and largest migration flows in

human history. However, since 2007 these flows have reversed, and for the next ten years, more Mexicans returned home than those migrating to the United States. Among the reasons that explain this flow reversal are the collapse of the construction market and the Great Recession of 2007–2009, increased border enforcement, and increased deportations (Gonzalez-Barrera, 2015). A majority of return migrants also cite family reunification as the main reason for going back home, while estimates indicate that, during the 2005-2010 period, between 5 and 35% returned due to deportation (Passel et al., 2012).

Based on empirical findings that Mexican returnees may be negatively selected relative to non-migrants (Campos-Vazquez and Lara, 2012), we would expect them to experience less favorable labor outcomes upon return. However, empirical evidence shows that return migrants enjoy wage premiums, are more likely to be entrepreneurs, and their businesses are more likely to survive (Reinhold and Thom, 2013; Wahba and Zenou, 2012; Marchetta, 2012).

The extent to which the individual effects of return migration may act as mechanisms for and translate into overall economic development remains largely unexplored. Independently of who and why individuals return, they are likely to use their experience abroad to improve their quality of life back home. This process may not just benefit migrants themselves but also improve local economic development through various channels, including increased entrepreneurship, investment, and knowledge transfer (Bahar et al., 2022).

This paper analyzes how the sharp increase in return migration has affected local economic development in Mexico, as captured by municipalities' social lag. To that end, we leverage the geographic variation in the surge in return migration rates between 2000 and 2010. Using panel data from both sides of the border, we examine the impact on

municipality outcomes before and after the flow reversal. We also inquire into dimensions of development likely affected by return migration via the impact on municipality outcomes related to individual-level channels documented in the literature—namely, income, labor concentration, education, and access to health care.

We find that return migration has a positive and significant effect on economic development. Our results are robust to various empirical specifications, sample restrictions, and alternative outcomes and do not appear to be driven by pre-existing trends. In line with return migrants' wage premiums and higher probability of entrepreneurial success, we also find that increased return migration results in a significant shift in the workforce distribution toward the manufacturing sector, increased per capita income, and improved access to health care services. Finally, we find improvements in literacy, school attendance and completion rates, as higher incomes, parental return, and potential changes in attitudes may affect educational outcomes. Together with evidence of return migrants' negative selection in the literature, this suggests that our findings are not simply the consequence of brain-drain reversal but instead appear to be driven by attributes acquired abroad.

The challenges we face in identifying the impact of return migration on economic development are the possibility that improved conditions back home may entice migrants to return, and that unobserved factors may impact both return migration and development. To address this potential endogeneity, we use a shift-share instrumental variable approach that exploits the state-level adoption of interior immigration enforcement policies in the U.S. as a plausible source of exogenous variation for return migration. We expect that increased immigration enforcement in the U.S. acts as a "push" factor through the deportation of

millions of migrants. Immigration enforcement may also lower the net benefits of staying in the U.S. via increased risk of deportation, diminished labor opportunities, and an overall lower quality of life. To generate our instrument's exposure shares, we link US-state immigration enforcement shocks to Mexican municipalities via 2.3 million consular identification cards issued to Mexican migrants in the U.S.

This paper also contributes to the migration literature by showing that return migration provides origin countries with much-needed resources that have the potential to support local economies. This expands the focus of existing research beyond individual experiences. Our results also inform public policy in origin countries aimed at managing the return of migrants. Facilitating reintegration and assisting returners in employing their savings and human capital acquired abroad could further enhance economic development at home. It could prove beneficial for traditional migrant-sending countries to streamline and ease restrictions on the repatriation of household goods and vehicles and enhance access to credit that supports entrepreneurial ventures. These policies may be timely for Mexico, as the recent migration flow reversal may call for a shift in priorities to programs and regulations that lift constraints and aid return migrants in their contributions toward economic development.

2. Background

Despite evidence on the positive effects of return migration, the analysis on economic development at the aggregate level remains largely theoretical (e.g., Dos Santos and Postel-Vinay, 2003; Dustmann et al., 2011). At the individual and household-level, existing studies mostly concur that return migrants benefit from their overseas tenure in several dimensions.

First, the literature has documented increased entrepreneurship and business survival among return migrants, as individuals invest their accumulated savings and overseas labor experience at home (e.g., Marchetta, 2012; Wahba and Zenou, 2012). Second, empirical studies also find a wage differential between migrants and non-migrants, attributed to overseas human capital accumulation rewarded in domestic labor markets (e.g., Reinhold and Thom, 2013; Wahba, 2015). Third, temporal migrants enable the diffusion of productive knowledge at home by bringing back new methods and technologies, which may translate into higher productivity (e.g., Choudhury, 2015; Bahar et al., 2022). Return migrants can also affect countries of origin by transferring foreign norms and standards to non-migrant residents, who may, for instance, demand improved political institutions (e.g., Batista and Vicente, 2011). Finally, related literature on the link between population size and economic activity finds that population increases triggered by the arrival of individuals can contribute to local development through agglomeration economies.[1] In the case of Mexico, it is possible that return migration has also spurred growth through a similar mechanism.

The evidence on labor-related effects focuses on migrants' wages, occupational choices, and productivity. Reinhold and Thom (2013) and Wahba (2015) find that returners earn wage premiums relative to non-migrants in Mexico and Egypt, respectively. This wage premium appears to be driven by upward occupational mobility achieved through human capital accumulation (El-Mallakh and Wahba, 2021). In contrast, for the Philippines, Abarcar (2016) finds that employers disfavor return migrants when responding to fictitious resumes and are

[1]Recent research on the mass arrival of refugees to West Germany after World War II shows that the resulting agglomeration effects in areas where refugees settled led to higher productivity, industrialization, wages, and income per capita in the medium and long runs (Ciccone and Nimczik, 2022; Peters, nd).

less likely to schedule interviews the longer the migrant's experience abroad. Using German employment data on repatriated Yugoslavian workers, Bahar et al. (2022) analyze the impact of return migration on the exports of related industries in the former Yugoslavia. The authors observe that the positive effect of return migration on exports is driven by improvements in industry-specific labor productivity, particularly by workers with high educational attainment and in professional occupations dominated by analytical tasks.

Further studies also find that a relatively higher proportion of migrants start entrepreneurial activities upon returning with the help of savings accumulated during the migratory experience (Dustmann and Kirchkamp, 2002). Batista et al. (2017) estimate that return migrants in Mozambique were approximately 25 percentage points more likely to own a business than their non-migrant counterparts. In addition to the generation of economic activities, these resources have also been found to improve the survival rate of returners' businesses by smoothing vulnerability and instability at home (Marchetta, 2012). Yang (2008) uses the Asian financial crisis as a natural experiment for Filipino households with migrants abroad and finds that households benefiting from positive exchange rate shocks show enhanced human capital accumulation and entrepreneurship.

Other studies have focused on the relationship between migration, return migration, and savings. In the context of Mexico, Bucheli and Fontenla (2020) find that the use of fixed-term saving accounts significantly increases in locations where migrants return, with the effect persisting years after the shock. This surge appears to be driven by savings that migrants accumulate at origin and destination while working overseas. Ashraf et al. (2015) conduct a randomized field experiment with transnational households in El Salvador and

find that U.S.-based migrants accumulate the most savings back home when offered more control over their accounts. However, this increase in savings may translate into decreased remittances (Chin et al., 2011).

Regarding education, Dinkelman and Mariotti (2016) find that temporary labor migration raises human capital formation in Malawi twenty years after individuals' migration experiences. They argue that income accumulated abroad may have persistent impacts in origin communities if households continue to invest in education after the income from migration subsides. Further, the migration literature on the education of children left behind provides us with an indication of the potential effects of return migration on education (e.g., Antman, 2012; Bucheli et al., 2018; Theoharides, 2018; Yang, 2008). We suspect that return migration and repatriated resources may have direct and indirect positive effects on education in several ways. First, with higher incomes and parent-child reunification, the need for child labor may decrease, and the likelihood of children's school attendance and performance may improve. Social norms acquired abroad may also improve households' preferences toward education. Finally, positive effects of return migration on the overall economy may improve the general quality of education within the community, potentially improving children's human capital accumulation regardless of the parental migration experience.

In terms of social norms and political outcomes, several studies have found positive effects of return migration on the promotion of democracy, while others have documented a decrease in electoral engagement. In the case of Mexico, Ambrosius and Meseguer (2020) find that voter turnout decreased in municipalities with higher rates of return migration, potentially due to deteriorating security and a perception of failure associated with migrants'

return. Alternatively, migrants who pursue education abroad, particularly in more democratic countries, are more likely to promote political rights at home and to improve democracy when they hold power (Spilimbergo, 2009; Mercier, 2016). Some of these effects are large enough to have contributed to regime changes in former Soviet republics (Barsbai et al., 2017).

Taken together, these channels support the development potential of return migration by improving the standard of living of return migrants and the economy at large. Our study contributes to the understanding of the impact of migration on the economic development of communities of origin after the conclusion of individuals' stints abroad.

2.1. The Mexican Case

For more than a century, the US-Mexico border witnessed one of the largest migration flows in human history. The Mexican-American war of 1846-1848 redrew the border, forcing many Mexicans to switch countries without moving. Since then, historical ties have supported mobility between the two nations. Unlike short-lived migratory flows, the contemporary Mexican-U.S. migration corridor has been active for more than one hundred years.

Throughout the 20th century the movement of Mexicans to the U.S. was primarily temporal, seasonal, and limited to the southwest. The enlistment of millions of U.S. citizens and the internment of thousands of ethnic Japanese during World War II, as well as the growing need for factory workers, caused labor shortages in the agricultural sector (Massey et al., 2002; Tokunaga, 2019). To address these constraints, the U.S. and Mexican governments signed a labor agreement in 1942, establishing a temporary guest worker program—the *Bracero* program. The agreement provided Mexican agricultural workers protection under

U.S. minimum wage laws, housing, transportation, food, and medical services. Although the program was intended as a wartime measure, it remained active until 1964. As a consequence, seasonal migration to the United States became embedded in the social and cultural fabric of many Mexican communities (Rosenblum and Brick, 2011).

Significant immigration reforms in the 1960s became the foundation of the current system. U.S. Congress passed the 1965 Immigration and Nationality Act, which favored family-based over employment-based immigration. In combination with legislation passed in the 1950s, which exempted businesses from being held liable for hiring unauthorized workers, and economic turmoil in Mexico in the 1970s and 80s, this law created strong incentives for irregular migration (Rosenblum and Brick, 2011). The debate surrounding immigration policy reached a crucial point after the 9/11 terrorist attacks as Congress passed legislation focused on homeland security, immigration enforcement, border security, and worksite measures. These renewed efforts resulted in over 2.6 million deportations, including 1.8 million Mexicans, conducted between 9/11 and the end of our study period in 2010 (DHS, 2011).

Mexican migration to the U.S. peaked at the outset of the 21st century when the number of Mexican migrants reached 12.8 million in 2007 (Figure 1). Since then, a greater flow of return migrants lowered the number of migrants to 11.3 million by 2017. Historically, U.S. immigration enforcement efforts focused the southwestern border, but post-9/11, renewed national security concerns shifted the focus toward the country's interior. In the absence of comprehensive immigration reform, federal agencies and local police departments implemented various measures to detain and remove millions of unauthorized immigrants across the U.S. This escalation in enforcement placed unauthorized immigrants at a higher risk of deportation

and created a hostile climate for all migrants, regardless of legal status.[2]

In addition to forced removals, increased enforcement likely affects migrants' decisions to return or shortens their migration experience. Stricter enforcement may lower the net benefits of staying, as immigrants face diminished labor opportunities and lower quality of life. For those who view returning as part of their original plans, a more hostile environment might induce them to return earlier than planned. Hence, it is likely that the increase in voluntary and forced return migration during our study period is, at least partly, a consequence of the intensification of immigration enforcement policies. In this context, we gauge the impact of return migration on the economic development of municipalities across Mexico.

[Figure 1 here]

3. Data

To estimate the impact of return migration from the United States on economic development in Mexico, we assemble a two-period, 2000-2010, panel for 2,442 Mexican municipalities from several sources in Mexico and the U.S.[3]

Economic Development

Our main outcome of interest is economic development, as captured by the *Social Lag Index* (SLI). This multidimensional index, estimated by Mexico's National Council for the

[2]Existing research finds that immigration enforcement efforts affect migrants' and their families' health, education, labor opportunities, and civic engagement (e.g., Amuedo-Dorantes et al., 2018; Amuedo-Dorantes and Lopez, 2017; Bucheli et al., 2021; Watson, 2014).

[3]Definitions and sources for all variables are detailed in Table A1 in the appendix.

Evaluation of Social Development Policy (CONEVAL) with information from the decennial census, is a standardized weighted sum of eleven deprivation indicators in education, access to healthcare, quality of housing, basic services, and household assets (CONEVAL, 2007).[4] The calculation of the SLI responds to Mexico's 2004 General Law of Social Development, which instituted a multidimensional approach to the measurement of poverty that avoids common shortcomings of income-based measures, such as the inability to account for differing price levels and capabilities to transform income into needs satisfaction across different localities.

Despite overall progress in economic development during our study period, a significant proportion of Mexican municipalities continue to face challenges, with over 40% of the adult population without complete basic education and approximately 33% with no access to public healthcare services (see Table A2 in the appendix). Considering the distribution of these deficiencies across the country, Figure 2 shows that economic development in Mexico exhibits large temporal and geographic variation. In 2000, the least developed municipalities—i.e., those with the highest SLI—were broadly dispersed in every region across the country, except for the Baja California Peninsula. By 2010, the country's overall situation improved, although there were still clusters of high-SLI municipalities along the western Sierra Madre mountain region and the south, particularly in the mostly-indigenous states of Chiapas, Guerrero, and Oaxaca. In both years, the highest levels of development were found along the northern border, the central Mexican plateau, and in large urban areas.

[Figure 2 here]

[4]Individual indicators and descriptive statistics can be found in Table A2 in the appendix.

Return Migration

Our independent variable of interest is the municipality-level return migration rate. We gather these data from Mexico's National Population Council (CONAPO), which defines return migration as the share of households with at least one member who lived in the United States in the previous five years and returned to Mexico before the 2000 and 2010 censuses. This variable is estimated with information collected during the census for each Mexican municipality m in census year t as follows:

$$Return\ Migration_{mt} = \frac{Households\ with\ at\ least\ one\ return\ migrant_{nt}}{Total\ number\ of\ households_{mt}} \times 100.$$

Figure 3 presents heat maps for the municipality-specific return migration rates in both years included in our study period. It shows that in 2000, return migration was almost exclusively concentrated in southwestern states and along the U.S.-Mexican border. States in eastern and southern Mexico hardly registered any return migration. In contrast, by 2010, every region in the country recorded significantly higher return migration rates. The share of municipalities with no return migration decreased by 27 percentage points, and the average return migration rate across all municipalities doubled from 1 to 2% of households (see Table A3). Using 2010 figures, the doubling of this rate represents an additional 280,000 households across Mexico with at least one return migrant.[5] A preliminary inspection of figures 2 and 3 hints at a negative relationship between return migration and the Social Lag Index.

A potential limitation of this variable is that it does not indicate whether migrants'

[5]Authors' calculations based on the number of households surveyed in Mexico's 2010 census (see: `https://www.inegi.org.mx/programas/ccpv/2010/`. Last accessed November 2021).

return was voluntary or forced. This information would have allowed exploring potential differential impacts by return type. Still, evidence in the literature suggests that the impact of return migration relies on resources migrants, including deportees, take back (e.g., labor experience) and the economic activities they engage in once they arrive home (e.g., initiating or joining an economic activity). Given that Mexican migrants deported between 2000 and 2010 lived in the U.S. for an average of five years (TRAC, 2018), it is likely that migrants accumulated labor experience and other assets that could be invested in Mexico, even when their departure from the U.S. was involuntary. Recent literature finds that return migrants have positive economic effects even when their return is forced, such as after the removal of Yugoslavian refugees from Germany in the 1990s (Bahar et al., 2022). As for voluntary return migration, which represented most of the flow during our study period, we expect a positive effect on economic development given the evidence in the literature discussed above. Thus, we consider our results as the average effect of forced and voluntary return migrants.

[Figure 3 here]

Additional Data

We also gather data on time-varying municipality characteristics that likely affect economic development in Mexico. To account for the broader role of migration, we obtain information on municipalities' migration and remittances rates from CONAPO. Migration rates are defined as the municipality-specific proportion of households with at least one migrant living in another country, while the remittances rate is defined as the proportion of households in a Mexican municipality receiving income from abroad. Both variables were estimated by

CONAPO with information collected during the 2000 and 2010 population censuses. Table A3 in the Appendix shows that the average municipality experienced a decline in migration during our study period from 4 to 2% of households, while remittances remained steady at 4% of households.

In addition, we collect information on demographic and economic characteristics across Mexican municipalities, such as population, indigenous population, and rural status. This accounts for the role of large population centers in facilitating economic development and addresses the social and economic inequities that disproportionately affect rural areas and indigenous people. Further, since our study corresponds with a period of significant drug trade-related violence and crime in Mexico, which placed it among the world's most violent countries, we collect information on the number of intentional homicides to account for the relationship between violence, migration, and economic development (e.g., Bucheli et al., 2019; Orozco-Aleman and Gonzalez-Lozano, 2018; Enamorado et al., 2014).

Finally, we obtain additional data to better understand the relationship between return migration and economic development. Specifically, we use food poverty, capability poverty, income per capita, and labor outcomes—namely, the percent of individuals aged 15 and older working in the primary, secondary, and tertiary sectors.[6] We also include the share of the population without access to public healthcare. For educational outcomes, we include school attendance rates, the share of individuals aged 15 and older with complete basic education, and municipalities' literacy rates. The descriptive statistics in Table A3 indicate that the

[6]The primary sector includes fishing, agriculture, livestock, and forestry. The secondary sector consists of mining, oil exploitation, and manufacturing. The tertiary sector involves tourism, commerce, financial services, and the communications sector.

share of Mexican workers in the primary sector decreased during our study period while the proportion employed in the secondary and tertiary sectors increased. During this time, income per capita, access to health care, and access to education appear to have improved as well.

4. Empirical Strategy

We aim to estimate the causal effect of return migration on the economic development of Mexican municipalities leveraging the sharp increase in return migration rates from the U.S. between 2000 and 2010. The main empirical challenge is that return migration and development likely determine each other and that additional factors may correlate with both variables. Improving conditions at home may encourage migrants to return to Mexico, while unobserved characteristics, like economic conditions faced by migrants in the U.S., may determine both return migration and municipalities' development. To address this challenge, we employ an instrumental variable approach that leverages the exogenous variation in return migration rates attributable to the activation of immigration enforcement policies in U.S. destination states. We estimate the following model via two-stage least squares (2SLS):

$$RetMig_{mt} = \gamma_0 + \delta z_{mt} + \boldsymbol{X}_{mt}\boldsymbol{\Gamma} + \theta_m + \theta_{st} + \nu_{mt} \tag{1}$$

$$Dev_{mt} = \beta_0 + \beta_1 \widehat{RetMig}_{mt} + \boldsymbol{X}_{mt}\boldsymbol{\beta} + \theta_m + \theta_{st} + e_{mt}, \tag{2}$$

where Dev_{mt} stands for the development outcome in Mexican municipality m during year t, $RetMig_{mt}$is the local return migration rate, and z denotes our instrumental variable—i.e., municipalities' exposure to changes in U.S. state-level immigration enforcement. We expect δ

to be positive, as stricter U.S. immigration enforcement may increase return migration to Mexico. The causal effect of return migration on development is captured by β_1, where an estimate of $\beta_1 < 0$ would indicate that the social lag index decreases when return migration increases—i.e., return migration from the U.S. contributes to economic development in Mexico. We discuss our identification assumptions and test the validity of the instrument below.

Vector $\boldsymbol{X}$ includes municipality characteristics likely affecting local economic development in Mexico. It includes migration and remittances rates to account for flows of resources and knowledge that accompany international migration. We also include rural status, indigenous population, and total population to control for demographic characteristics found to affect various dimensions of development in Mexico (e.g., Magaña-Lemus et al., 2016), as well as homicide rates to proxy for the effect of violence and crime on development (e.g., Enamorado et al., 2014). We also use municipalities' nearest neighbors' SLI to account for the potential role of regional economic characteristics on municipalities' development. In this way, we consider that a municipality's development may be limited by low economic growth or economic opportunities in neighboring municipalities. Lastly, we control for industry location quotients to proxy for potential industry concentration affecting development. Some of these covariates may themselves be affected by return migration—i.e., enter the model as 'bad controls' and bias our estimates. Thus, we present the estimates obtained without time-varying controls in the main body of the paper, but verify the robustness of our results to the inclusion of controls in the appendix.

In addition, equations (1) and (2) include municipality (θ_m) and Mexican state-year (θ_{st}) fixed effects to capture unobserved factors affecting return migration and development.

Municipality fixed effects account for time-invariant characteristics across municipalities, such as geographical conditions and the existence of historical migration networks. State-year fixed effects capture unobserved characteristics driving return migration and development in each Mexican state over time. In the estimation of equations (1) and (2), all regression coefficients are weighted by baseline municipality populations and standard errors are clustered at the municipality level. In alternative specifications, we account for the shift-share design of our instrument by adjusting the standard errors on return migration and the instrumental variable following Adão et al. (2019).

4.1. U.S. Immigration Enforcement as an Instrumental Variable

To identify the causal effect of return migration on Mexican municipalities' economic development, we use a shift-share instrumental variable approach. The shifts, or shocks, correspond to the state-level adoption of four immigration enforcement policies between 2000 and 2010 across the 50 U.S. states, while the exposure shares are generated with information from consular identification cards issued by the Mexican government to its nationals residing in the United States. These cards contain information on the person's municipality of birth in Mexico and the state of residence in the United States, allowing us to estimate the share of migrants from each municipality living in each U.S. state.

To estimate the shock component of the instrument, we gather information on the activation of four immigration enforcement policies in the U.S. during our study period—namely, 287(g) task-force and jail agreements, the Secure Communities program, and employment

verification mandates (E-Verify).[7] The activation of these programs followed a staggered approach, as different states implemented the various policies at different times (see Figure A1). We combine these policies into a composite measure that captures each Mexican municipality's exposure to U.S. immigration enforcement:

$$Immigration\ Enforcement_{mt} = \sum_{s \in S}^{S} \left(\pi_m^s \times \frac{1}{K} \sum_{k \in K}^{K} EI_{st}^k \right), \quad \sum_{s \in S}^{S} \pi_m^s = 1, \tag{3}$$

where EI_{st}^k is the enforcement intensity, or shock, for policy k in each U.S. state s during year t, $t = \{2000, 2010\}$, and π_m^s is the baseline share of migrants from each Mexican municipality m living in each U.S. state s. Thus, *Immigration Enforcement* ranges from 0 (no immigration enforcement) to 1 (all immigration policies in place). Figures A2 and A3 in the Appendix show the geographic variation in immigration enforcement policy changes over the 2000-2010 period by U.S. state and migrants' Mexican municipalities of origin. Figure A2 indicates that the largest policy changes in the U.S. were implemented in the states of Arizona and Georgia, although increases in immigration enforcement are also observed across the southern and southwestern states, as well as in the country's Midwest and Northeast. Figure A3 shows that migrants from municipalities in the Mexican state of Sonora—across the border from the U.S. state of Arizona—were exposed to the largest change in immigration enforcement. In

[7] Under the 287(g) task-force program, federal immigration authorities delegate functions to local law enforcement, including screening and detaining suspects of immigration violations. In the 287(g) jail program, detainees are screened to determine their immigration status. In the Secure Communities program, federal authorities identify undocumented immigrants when local law enforcement agencies check arrestees' fingerprints against FBI criminal databases as part of routine detention procedures. The E-Verify system is a federal program that allows employers to verify applicants' eligibility to work in the United States. The 287(g) programs are voluntary agreements between federal and local agencies, while Secure Communities was implemented by the federal government. E-Verify was launched as a federally-run program required for government contractors, but several states enacted legislation making it mandatory for most new hires.

contrast, policy changes experienced by migrants from other states appear to have been more moderate and scattered. In the robustness section below, we experiment with the exclusion of municipalities located in Mexican border states to check for heterogeneity in our estimates.

Finally, equation (1) accounts for municipalities' exposure to the immigration enforcement measure constructed in equation (3) based on differing baseline emigration levels. Hence, we create our instrument by interacting *Immigration Enforcement* with municipality-specific baseline migration rates to account for their relative exposure to external shocks.[8] Section A.1 in the appendix expands on the construction of the instrument and the use of consular cards to create bilateral migration flows.

4.2. Identification Assumptions

Our key identifying assumption is that the variation in U.S. states' immigration enforcement is correlated with changes in Mexican municipalities' development exclusively through return migration. Identification thus requires (i) that Mexican municipalities' economic development does not determine immigration policy changes in U.S. states, and (ii) that no third factors are simultaneously correlated with changes in development in Mexico and U.S. immigration policies. A violation of these assumptions would hinder our instrument's inferential power and ability to interpret our estimates as causal. This can occur if the shock distribution is correlated with municipality characteristics or if shocks are not meaningfully idiosyncratic across U.S. states. In the context of a shift-share instrument, these requirements are what

[8]This framework is similar to Yang (2006), who leverages exposure to overseas exchange rate shocks to analyze migrants' decisions to return to the Philippines. Consistent with life-cycle behavior, the author finds that positive exchange rate shocks lead to lower return migration as the marginal benefit of staying abroad improves. In a similar vein, McKenzie et al. (2014) use fluctuations in destination countries' GDP to estimate a positive effect of economic growth on migration decisions.

Borusyak et al. (2021) refer to as the randomness and orthogonality of the shocks assignment.

Our main concern with the first identification requirement is the possibility that economic development in Mexican municipalities determined the U.S. state immigration enforcement policies these municipalities were exposed to. This relationship could exist if the economic characteristics of Mexican municipalities determined the type of migrants, the size of the flow, or where migrants moved to, and, in turn, the immigration enforcement policies U.S. states adopted based on the mix or number of migrants they received.

We check for potential violations of this identification assumption by assessing whether changes in immigration enforcement correlate with baseline municipality development and return migration rates, as this would indicate potential reverse causality or pre-existing differential trends. To that end, we conduct a shock balance test by running separate regressions for various residualized baseline municipality characteristics on the residualized change in Mexican municipalities' exposure to U.S. immigration enforcement during 2000-2010. All variables are residualized with respect to Mexican state fixed effects. Table 1 presents the results from this exercise.

The first row of Table 1 shows that stricter U.S. immigration enforcement is not significantly or meaningfully correlated with municipalities' baseline economic development. The magnitude of the coefficient indicates that a one standard deviation increase in the residualized change in immigration enforcement is associated with an *increase* of 4.7% of a standard deviation in the residualized baseline social lag. Recalling that an increase in social lag represents lower economic development, this result suggests that municipalities exposed to stricter immigration enforcement had a marginally lower, although not statistically significant,

level of economic development in 2000. Row (2) presents the only statistically significant correlation, although still weak. It indicates that a one standard deviation increase in the residualized change in immigration enforcement is associated with a *decrease* of almost 9% of a standard deviation in residualized baseline return migration rates. If our concern was that municipalities exposed to tougher immigration enforcement already exhibited higher return migration or economic development, these results suggest the opposite. Similarly, rows (3) and (4) show that future changes in U.S. immigration policies are essentially uncorrelated with Mexico's baseline migration and remittance reception rates. The estimates in both regressions indicate that a one standard deviation increase in the residualized change in immigration enforcement corresponds to a *decrease* of about 3% of a standard deviation in residualized baseline migration and remittances.

Regarding the second identification requirement, a potential concern is that omitted variables may exist that simultaneously correlate with variation in immigration policies adopted by U.S. states and the development of Mexican municipalities. While we assess these concerns below, the inclusion of municipality and Mexican state-year fixed effects should account for unobserved factors affecting return migration and economic development. Economic shocks, such as the appreciation of the U.S. dollar relative to the Mexican peso, could increase demand for export industries in Mexico, leading to growth in municipalities where these industries are concentrated but depressing labor demand in competing U.S. states. In response, affected states could impose harsher immigration policies to protect local employment, increasing return migration to Mexico. Our strategy would then incorrectly identify this spurious association as an increase in return migration contributing to develop-

ment in Mexico. To examine this possibility, we estimate the correlation between residualized changes in U.S. immigration enforcement and municipalities' residualized baseline industrial composition and exposure to external economic shocks. Rows (5)–(11) in Table 1 present the correlation estimates for the industry location quotients for several sectors and the trade openness index—estimated for each municipality as $(exports + imports)/GDP$.[9] Table 1 shows that the residualized change in U.S. immigration enforement is very weakly correlated with municipalities' residualized baseline industrial composition and trade openness. The lack of significance and low magnitude of these correlations suggests that they are not a significant source of concern for the identification strategy.

Next, we examine the possibility that exposure to U.S. immigration enforcement may be determined by the migrant mix U.S. states receive, as proxied by Mexican municipalities' baseline social and demographic characteristics. We correlate municipalities' residualized changes in exposure to U.S. immigration policies with residualized baseline school completion rates, rurality, indigenous population share, total population size, and homicide rates. An increase in drug-related violence in Mexico, for example, could lower the economic development prospects of affected municipalities and force people to migrate. This could lead U.S. states receiving migrants from affected municipalities to increase their immigration enforcement. In this case, the negative bias would suggest that increased return migration leads to a decline in development. The bottom of Table 1 shows that the correlation between exposure to a higher level of immigration enforcement and almost all demographic or violence-related factors is close to zero. Only the residualized baseline population size appears to be very

[9]Existing research finds that Mexico's economic liberalization, including in its international trade, has made the country vulnerable to external shocks (e.g., Blecker, 2009).

weakly correlated with changes in immigration policies but in the opposite direction of our concern. Altogether, Table 1 does not support the potential concern that our instrument may be endogenously determined, or that our estimates may be biased due to potential omitted variables related to municipalities' economic, social, or demographic characteristics.

[Table 1 around here]

From the U.S. perspective, we check for the possibility that unobserved state-level policies and characteristics confound U.S. immigration enforcement policies and development in Mexico in a way that would bias our results. In the shift-share framework, this would violate the shock-level orthogonality (Borusyak et al., 2021), as conditions in the U.S. would be simultaneously correlated with higher U.S. immigration enforcement and economic development in Mexico. We explore this concern by individually regressing various residualized U.S. states' characteristics likely linked to other mechanisms impacting development in Mexico on the residualized U.S. immigration enforcement for 2000 and 2010. Table A4 in the appendix presents two alternatives for this exercise—one with residualized characteristics with respect to year fixed effects alone and another with respect to both year and U.S. state fixed effects.

The results show a weak and negative correlation between the concentration of agriculture, construction, and manufacturing and the level of immigration enforcement, where a one-standard-deviation increase in the residualized concentration of these industries is associated with a 6 to 24% standard deviation *decrease* in the residualized immigration enforcement. Alternatively, we observe a positive but still weak correlation for the residualized concentrations of wholesale and retail trade, leisure, and education and health, where a one-standard-deviation increase in residualized immigration enforcement is accompanied by

an increase in the residualized concentration of these sectors by 10 to 22% of a standard deviation.

We also explore the possibility that local authorities in the U.S. respond to deteriorating economic conditions, such as rising unemployment and poverty rates, by implementing additional immigration enforcement measures. In addition to return migration, in this case, declining labor conditions in the U.S. could affect municipalities in Mexico through a decrease in individuals' willingness to migrate and ability to remit (e.g., Parrado, 2012). The results on unemployment indicate a weak correlation in the opposite direction of our concern; a surge in U.S. unemployment—which could harm development in Mexico through reduced remittances, for example—is accompanied by an increase in immigration enforcement, which we show contributes to an increase in return migration. This correlation would then introduce a downward bias in our estimated relationship of interest.

Next, we examine whether variation in other policy mechanisms at play in the U.S., such as political representation, law enforcement presence, and attitudes toward migrants, are correlated with states' immigration policies. As expected, more conservative states appear more likely to adopt stricter immigration policies. We find that a one-standard-deviation increase in residualized immigration enforcement is correlated with a one-fifth standard deviation increase in the residualized likelihood of having state-level Republican elected officials. Once again, this relationship goes opposite to our concern as a tougher immigration enforcement environment in Republican-leaning states could harm Mexico's development by limiting migrants' assimilation prospects and labor opportunities abroad, thus lowering their likelihood of remitting or accumulating capital. We also find that residualized immigration

enforcement is negatively correlated with the residualized rates of hate crimes and violent crimes but has not relationship with the number of law enforcement officers.

Finally, the bottom of Table A4 displays the correlation between residualized U.S. immigration enforcement and residualized demographic characteristics likely to describe individuals targeted by these policies. As can be expected, states with a higher proportion of Hispanics and Mexicans are more likely to have adopted stricter immigration enforcement policies. One can think of these correlations as indicative of local immigration enforcement efforts in the U.S. targeting Mexican immigrants, supporting the relevance of the instrumental variable in explaining the variation in return migration rates.

5. Results

5.1. Main Results

Table 2 presents the main results of our paper from the estimation of equations (1) and (2). Our baseline specification in column (1) includes return migration, along with municipality and Mexican state-year fixed effects. Column (2) presents the results with the Adão et al. (2019) standard errors to account for the instrument's shift-share structure. Column (3) shows OLS estimates for comparison. Model estimates from specifications that include time-varying controls are available in Tables A5 and A6 in the appendix.[10]

[10]Besides return migration, municipality time-varying characteristics, such as economic and demographic characteristics, may also impact development and could thus enter our model as controls. However, it is likely that these characteristics are also affected by return migration, which would bias the estimates on return migration. To avoid this potential bias, we exclude them from the estimation of equations (1) and (2) in Table 2 but include the results from fully adjusted models in the appendix. As observed in the tables, our results are robust to the inclusion and exclusion of various controls.

Regardless of the model specification, the results consistently show that return migration has a negative effect on social lag, i.e., a positive effect on economic development. Specifically, a one-percentage-point increase in return migration, similar to the average change observed during our study period, lowers a municipality's SLI by 0.118 standard deviations. To put this magnitude in perspective, the occurrence of a natural disaster during the same period, on average, led to a similar reduction in the affected municipalities' human development index and a similar increase in the incidence of food poverty and capability poverty (Rodriguez-Oreggia et al., 2013). That we observe this effect on economic development, despite evidence in the literature that return migrants are negatively selected relative to those who never migrated, points to the transformative potential of the migration experience for individuals and their home communities.

The bottom panel in Table 2 supports the relevance of our instrumental variable by reporting a positive and significant impact of U.S. immigration enforcement exposure on return migration rates. The first-stage diagnostics show that the Kleibergen-Paap rk LM underidentification test rejects the null hypothesis that the structural equation is misspecified and underidentified. In terms of instrument strength, both the Kleibergen-Paap Wald F-statistic and effective F-statistic in Montiel Olea and Pflueger (2013), which accounts for potential heteroskedasticity, autocorrelation, and clustering, indicate that instrument weakness is not a source of concern with statistics well above the required thresholds.

Finally, we check for potential confounding effects of migration and remittances and 'bad controls' by sequentially including and excluding them from our model. While our specifications in Tables A5 and A6 do not ensure the concurrent exogeneity of all control

variables, results are suggestive of migration and remittances not significantly affecting economic development. This result is in line with the mixed evidence documented in the literature (e.g., Orrenius et al., 2010). For instance, migration can cause brain drain, reduce the size of the high-wage labor force, or increase child labor and lower school performance through parent-child separation (McKenzie and Rapoport, 2006). Alternatively, it allows impoverished individuals to access employment opportunities and improve their quality of life. In the same vein, remittances may relax households' budget constraints and promote investments in human capital (Antman, 2012; Bucheli et al., 2018) or reduce labor supply among recipients (Orrenius et al., 2010).

[Table 2 here]

5.2. Robustness and Placebo Checks

We repeat the analysis on additional development indicators and data sub-samples, and conduct a falsification test to provide further evidence of return migrants' impact on communities of origin. First, we gauge the impact of return migration on two additional development measures—food poverty and capability poverty—to assess the robustness of our findings in the previous section. *Food poverty* measures the proportion of households in a Mexican municipality unable to acquire a basic food basket, even if they allocate all of their income toward buying goods in the basket. *Capability poverty* is defined as the proportion of households unable to acquire a food basket and make necessary expenses in health and education, thus capturing individuals' ability to sustain human development.

Data from Mexico's National Institute for Federalism and Municipal Development

(INAFED) reveal that food poverty incidence stood at 24% in 2000 while capability poverty exceeded 30%. Ten years later, food poverty had declined to 19%, and capability poverty dropped to 27%. We use these data to re-estimate our main specification with food and capability poverty as dependent variables. The results from this exercise are presented in Panel A, Table 3, along with the dependent variable means to provide context for the coefficient magnitudes. We find that a one percentage point increase in return migration lowers the rate of food poverty by approximately 8% and capability poverty by 5%.[11]

In addition, we conduct a falsification test using the lagged values of food poverty and capability poverty as placebo outcomes to verify that spurious correlations or pre-existing trends do not drive our results. In this case, we test whether 2000 and 2010 return migration rates can explain lagged levels of food and capability poverty from 1990 and 2000, respectively.[12] As shown in Panel B, Table 3, this check reveals that the coefficient on return migration is practically zero for either placebo outcome. Overall, these results support the assumption of parallel trends in municipalities' development prior to the surge in return migration from the U.S. in the 2000s. It also supports the interpretation of our findings as causal by suggesting that the estimated impact of return migration in Table 2 and panel A in Table 3 is not the result of spurious correlations.

[Table 3 here]

[11] Estimated as $(\beta/\mu \times 100)$, where $\beta = -0.018$, $\mu = 0.220$ for food poverty, and $\beta = -0.016$, $\mu = 0.291$ for capability poverty. Table A7 in the appendix indicates that the estimates are robust to the inclusion of municipality time-varying controls.

[12] We are unable to perform this exercise with the Social Lag Index as Mexico's CONEVAL first developed the SLI following the adoption of Mexico's General Law of Social Development after the 2000 census. In contrast, food and capability poverty were introduced after the 1990 census.

Further, in Table A8 in the Appendix, we assess the heterogeneity of our results by exploring the impact of return migration on different Mexican municipality sub-groups. In columns (1)–(4) we exclude urban areas and U.S.-border states as they display the highest levels of development (see Figure 2) and may have characteristics that make returning more desirable. Columns (1) and (2) show that, regardless of the model specification, the estimated impact of return migration is still significant in rural areas but smaller in magnitude—about a third of the effect estimated with the full sample. Columns (3) and (4) reveal that there is no change in the effect when we exclude the northern border region, suggesting that the contribution of return migration to development is not concentrated in areas that led Mexico's industrial development and trade in the 2000s (ECLAC, 2018).

In columns (5) and (6), we exclude municipalities that experienced declining return migration rates, despite our period being characterized by an overall surge in return migration. These areas could bias our estimates if local unobserved characteristics that discourage migrants from returning correlate with lower economic development levels. Still, our results are consistent with those obtained with the full sample. Finally, we consider the possibility that if remittances are linked to both return migration and economic development, our main result could be driven by remittances rather than return migration. The last two columns in the table show that when we exclude municipalities with remittance reception rates more than a standard deviation above the national mean, the impact of return migration remains similar to our baseline results.

5.3. Dimensions of Development

Our main results show that the surge in return migration from the U.S. contributed to aggregate economic development in Mexico. This section examines the impact on additional dimensions to understand how return migration may support community development.

As discussed in the literature review, return migrants enjoy wage premiums, are more likely to be entrepreneurs, and their businesses are more likely to succeed. Besides allowing individuals to improve their quality of life, better labor outcomes among return migrants likely affect other workers and their communities through increased business activity and better-paying jobs. Thus, to examine if these individual labor market effects accompany overall community effects, we estimate the impact of return migration on municipalities' income per capita and the share of the workforce employed in the primary, secondary, and tertiary sectors. We also analyze the impact on health and education by looking at the population share with no access to health care services, as well as school attendance rates, the share of individuals older than 15 with complete basic education (grades 1-9), and adult illiteracy rates. We suspect that higher incomes, parental return, and potential changes in attitudes toward education may all affect educational outcomes. Table 4 shows the impact of return migration on these dimensions.

Panel A presents the results for income and labor outcomes. In column (2) we observe that a one-percentage-point increase in return migration led to a 2% increase in per capita income. Columns (5) and (6) suggest that this increase could have resulted from workforce reallocation toward the manufacturing sector, while we find non-significant effects for the primary and tertiary sectors. Panel B reports the impact of return migration on health and

educational outcomes. The second column shows that the share of municipalities' populations without access to health care services decreased by 13%.[13] These are services offered through private and public health insurance programs, highlighting the potential of return migration in the generation of formal jobs. Next, columns (3) through (6) focus on educational outcomes among youth and adults. Each one-percentage-point increase in return migration improved school attendance rates by 0.7% and basic education completion rates by 1.1%. Finally, the last two columns show that return migration also increased adult literacy rates. These positive aggregate-level effects of return migration on education align with the individual-level impacts documented in other contexts (e.g., Dinkelman and Mariotti, 2016).

Lastly, panel C considers whether an increase in return migration could affect development in Mexico through changes in migration, remittances, trade, or knowledge transfer. We capture trade with the trade openness index[14] and use voter turnout during national elections as a proxy for knowledge transfer (i.e., social remittances in the form of democracy).[15] The estimates from these regressions show that return migration is associated with lower migration, remittances, and trade openness, yet we observe a positive effect on economic development. We also observe that the diffusion of democracy through increased voter turnout is positively correlated with return migration. These results are indicative of return migration having an impact on economic development beyond the continuation or interruption of the flow of

[13]Estimated as $(\beta/\mu \times 100)$, where $\beta = -0.059$, $\mu = 0.455$.

[14]Calculated as $(exports + imports)/GDP$

[15]Research on migration and the transmission of information finds evidence of the promotion of democracy as indicative of knowledge transfer (e.g., Barsbai et al., 2017; Chauvet and Mercier, 2014). Alternatively, Ambrosius and Meseguer (2020) documents a significant relationship between return migration and voter turnout but with the opposite sign.

resources from abroad.

[Table 4 here]

6. Conclusion

Returning home is part of many migrants' original plan. Existing research documents the role that capital, skills, and social norms acquired overseas play in return migrants' reintegration following their stints abroad. Although migration and remittances could contribute to growth in origin countries, the literature has generally overlooked return migration as a potential contributor to economic development. We address this gap by providing causal evidence of how the unprecedented surge of return migrants contributed to economic development in Mexico.

We compile a dataset for all Mexican municipalities between 2000 and 2010 to examine the impact of return migration on social lag and other development outcomes. The empirical strategy uses an instrumental variable approach that leverages exogenous variation in state-level interior immigration enforcement policies in the United States. We find that a one-percent increase in return migration rates lowers social lag by 0.1 standard deviations as well as food and capability poverty by 6 and 4%, respectively. This impact appears stronger in urban areas and proves robust to the exclusion of wealthier border states and remittance recipient outliers. We also verify the validity of our findings with a falsification test that provides suggestive evidence that pre-existing trends do not drive the impacts. Additionally, our analysis highlights critical dimensions through which return migration affects municipalities' economic development, including increased per capita income, a shift in the workforce distribution

toward manufacturing, better access to health care, improved educational outcomes, and knowledge transfer. In sum, we show that migrants have the capacity to contribute to economic and social progress back home after their experiences abroad have concluded.

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Table 1: Shock Balance Test on Baseline Municipality Characteristics

	Coefficient (SE)
Development and migration	
Social lag index	0.047
	(0.060)
Households with return migration (%)	-0.088**
	(0.039)
Households with intl. migrants (%)	-0.034
	(0.055)
Households receiving remittances (%)	-0.038
	(0.044)
Industry location quotients and trade openness	
Agriculture	-0.008
	(0.022)
Construction	0.005
	(0.083)
Manufacturing	-0.009
	(0.056)
Wholesale and retail trade	-0.009
	(0.038)
Leisure and Hospitality	0.025
	(0.033)
Services	-0.008
	(0.031)
Trade openness index (2004)	-0.033
	(0.055)
Other municipality characteristics	
Population 15+ with complete basic education (%)	-0.009
	(0.062)
Rural municipality	0.011
	(0.039)
Indigenous population (%)	-0.021
	(0.043)
Total population (log)	-0.078
	(0.067)
Homicide rate (log)	0.017
	(0.018)
Observations	2,442

Note: The table coefficients δ were estimated separately for each baseline municipality characteristic j as follows: $\mu^{j}_{ms,2000} = \alpha + \delta^{j} e^{2000-2010}_{ms}$, where the dependent variable, $\mu^{j}_{ms,2000}$, is the standard residualized baseline characteristic j for municipality m in state s, and the independent variable $e^{2000-2010}_{ms}$ is the standard residualized change in U.S. immigration enforcement between 2000 and 2010 to which municipalities were exposed. All baseline municipality characteristics and the change in immigration enforcement were residualized with respect to Mexican state fixed effects. Coefficients are interpreted as the standard deviation change in each residualized baseline municipality characteristic with a one-standard-deviation increase in the residualized change in U.S. immigration enforcement. The location quotients indicate the municipality-specific distribution of employment in a particular industry relative to the entire country. The trade openness index is calculated as $(exports + imports)/GDP$ with the earliest available data at the municipality level (2004). All regressions include a constant and are weighted by the baseline municipality population. Standard errors in parentheses are clustered at the state level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Impact of Return Migration on Social Lag Index (2000-2010)

	2SLS		OLS
	(1)	(2)	(3)
Households with return migration (%)	-0.118***	-0.118***	-0.075***
	(0.0162)	(0.0001)	(0.0090)
Municipality FE	Y	Y	Y
State-year FE	Y	Y	Y
SEs on return migration and the IV	Cluster	AKM	Cluster
Observations	4884	4884	4884
First-Stage IV			
US immigration enforcement	1.021***	1.021***	–
Cluster-robust standard error	0.057	0.057	–
Kleibergen-Paap LM stat for underid.			
χ^2	133.85	133.85	–
p-value	0.001	0.001	–
Kleibergen-Paap Wald F-stat for weak IVs	324.84	324.84	–
Montiel Olea & Pflueger (2013) effective F-stat	162.39	162.39	–

Note: The dependent variable is the municipality-level social lag index. Our independent variable of interest, return migration, is defined as the share of households in a municipality with a return migrant. The coefficient on return migration indicates the standard-deviation change in the SLI with a one-percentage-point increase in return migration: $\beta = \Delta\sigma_{SLI}$. All model specifications include municipality and state-year fixed effects. Standard errors in parentheses in columns (1) and (3) are clustered at the municipality level. In column (2), the standard errors on return migration and the instrumental variable are adjusted following Adão et al. (2019). Model estimates from specifications that include time-varying controls available in Table A5 in the appendix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: 2SLS Estimates of the Impact of Return Migration on Alternative and Placebo Development Measures

Panel A: Alternative development measures (2000-2010)		
	Food poverty	Capability poverty
Households with return migration (%)	-0.018***	-0.016***
	(0.0020)	(0.0020)
Municipality FE	Y	Y
State-year FE	Y	Y
Dependent variable mean	0.220	0.291
Observations	4884	4884
Panel B: Placebo development measures (1990-2000)		
	Food poverty	Capability poverty
	(1)	(2)
Households with return migration (%)	-0.003	-0.004*
	(0.0021)	(0.0022)
Municipality FE	Y	Y
State-year FE	Y	Y
Dependent variable mean	0.237	0.307
Observations	4884	4884

Note: In this table, the dependent variables are the incidence of food poverty and capability poverty. Food poverty measures the proportion of households in a municipality that are unable to cover a basic food basket. Capability poverty captures the share of households in a municipality that are unable to acquire a food basket and make necessary expenses in health and education. In panel A, the dependent variables and return migration rates are contemporaneous, corresponding to 2000 and 2010. In panel B, we conduct a placebo test by repeating the analysis using lagged values for food poverty and capability poverty from 1990 and 2000. All model specifications include municipality and state-year fixed effects. Robust standard errors clustered at the municipality level in parentheses. Model estimates from specifications that include time-varying controls available in Table A7 in the appendix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

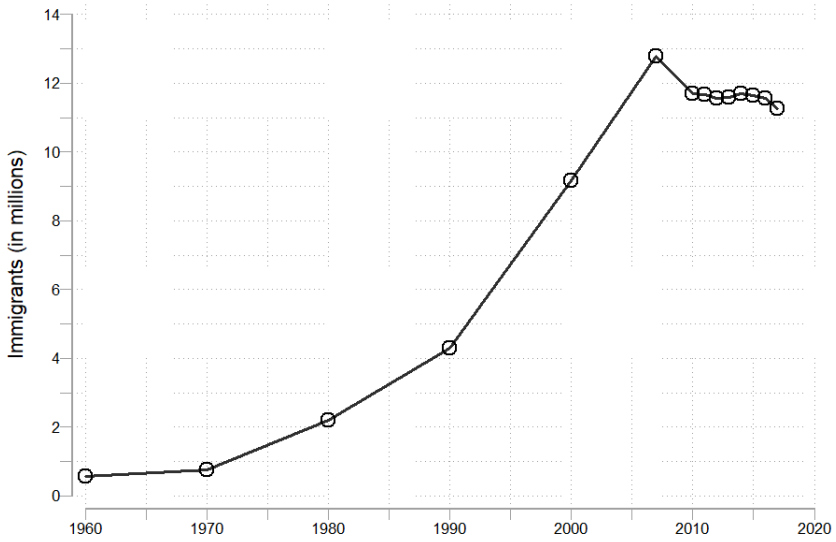
Table 4: 2SLS: Return Migration on Additional Dimensions of Developmment (2000-2010)

Panel A: Income and Labor				
	Income per capita (log)	Primary sector	Secondary sector	Tertiary sector
Hhs with return migration (%)	0.014	-0.001	0.004***	-0.003*
	(0.0093)	(0.0016)	(0.0013)	(0.0015)
Municipality FE	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y
Dependent variable mean	9.403	0.171	0.257	0.551
Observations	4836	4884	4884	4884
Panel B: Health and Education				
	No access to health care	School attendance (6-14)	Complete basic educ. (age:15+)	Literacy rate (15+)
Hhs with return migration (%)	-0.067***	0.007***	0.006***	0.003***
	(0.0050)	(0.0008)	(0.0009)	(0.0007)
Municipality FE	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y
Dependent variable mean	0.455	0.938	0.523	0.914
Observations	4884	4884	4884	4884
Panel C: Additional Outcomes				
	Migration rate	Remittances rate	Trade openness	Voter turnout
Hhs with return migration (%)	-0.028***	-0.006***	-0.029**	0.017***
	(0.0021)	(0.0015)	(0.0121)	(0.0017)
Municipality FE	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y
Dependent variable mean	0.032	0.041	0.264	0.635
Observations	4884	4884	4884	4856

Note: All model specifications include municipality and state-year fixed effects. In panel A, the dependent variable in column (1) is the log income per capita, and in columns (2)–(4) is the percent of individuals aged 15 and older working in the primary, secondary, and tertiary sectors. The primary sector includes fishing, agriculture, livestock, and forestry. The secondary sector consists of mining, oil exploitation, and manufacturing; and the tertiary sector involves tourism, commerce, financial services, and the communications sector. In panel B, the dependent variable in column (1) is the proportion of the population without access to public health care services. In column (2), it is the school attendance rate among children aged 6-14, in column (3) is the share of individuals aged 15 and above with complete basic education, and in column (4) is the adult literacy rate. In panel C, column (1), the dependent variable is the municipality-level migration rate. In column (2), we model the impact on the remittances reception rate. In column (3), the dependent variable is the trade openness index calculated as $(exports + imports)/GDP$. Column (4) estimates the impact of return migration on voter turnout during the presidential elections of 2000 and 2012. Robust standard errors clustered at the municipality level in parentheses. Model estimates from specifications that include time-varying controls available in Table A9 in the appendix. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figures

Figure 1: Mexican-born Immigrants in the United States (1960-2017)



Note: The figure shows the evolution of the foreign-born Mexican immigrant population in the United States. The number of Mexican immigrants peaked in 2007 at 12.8 million and has oscilated around the 11.6 million mark since then. The most recent year included is 2017, with 11.3 million immigrants. Data obtained from the Migration Policy Institute (MPI, 2020) and the Pew Research Center (Passel et al., 2012).

Figure 2: Social Lag Index by Mexican Municipalities (2000 and 2010)

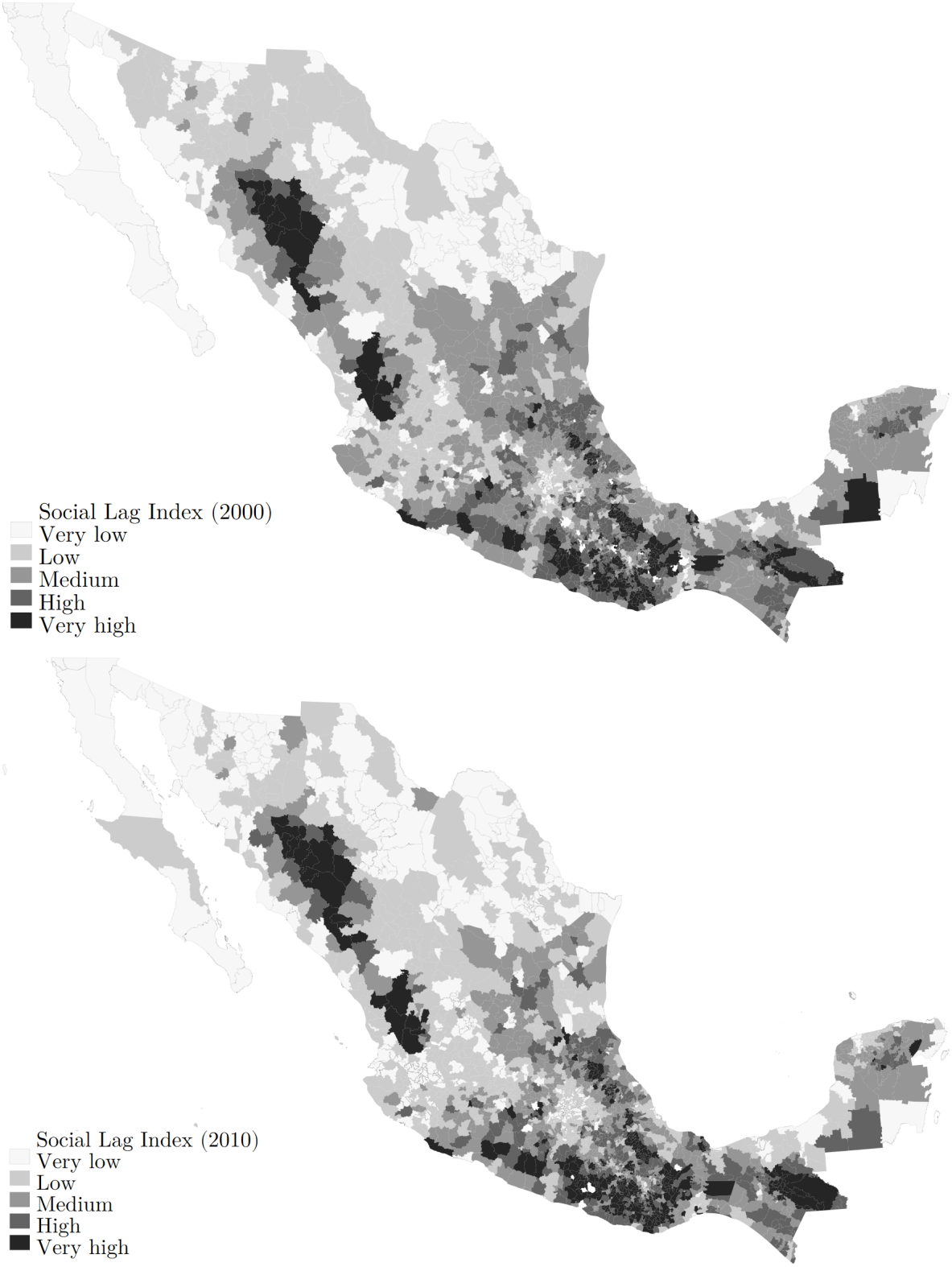
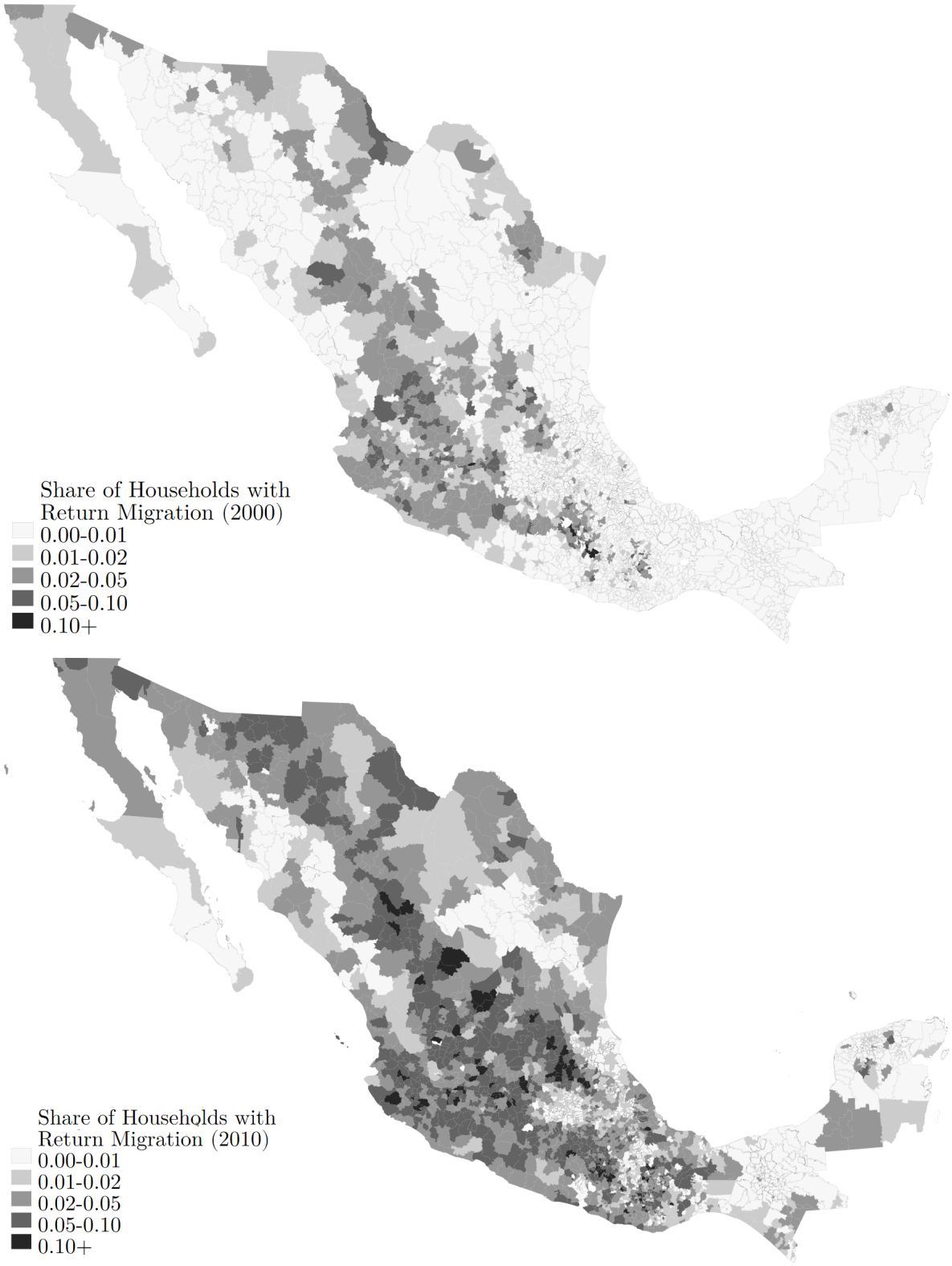


Figure 3: Return Migration by Mexican Municipalities (2000 and 2010)



Appendix

A.1. Construction of the U.S. Interior Immigration Enforcement Index

We construct our instrumental variable as a composite index of U.S. interior immigration policies that captures the average enforcement intensity to which Mexican municipalities were exposed. We use annual data from the Urban Institute on the enactment of four immigration enforcement programs between 2005 and 2010—namely, Secure Communities, the jail and task-force variations of the 287(g) agreements, and E-Verify Mandates. First, we create a measure of enforcement intensity EI for policy k, $k = 1...K$ in each U.S. state s:

$$EI_s^k = \frac{1}{T} \sum_{t \in T}^{T} E_{st}^k. \tag{A1}$$

E_{st}^k is an indicator for the existence of enforcement policy k in U.S. state s during year t. It equals zero if the policy was not active, 0.5 if it covered the majority of counties in the state, and one if it covered the entire state. T indicates the number of years that each policy was active anywhere in the country between 2005 and 2010—the period of fastest immigration enforcement intensification. We then combine the individual scores for each enforcement policy in equation (A1) to obtain a state-specific composite measure of immigration enforcement:

$$Total\ Enforcement_s = \frac{1}{K} \sum_{k \in K}^{K} EI_s^k, \tag{A2}$$

Next, we merge the state-level immigration enforcement measure in equation (A2) to municipalities in Mexico by estimating Mexican-municipality-to-US-state bilateral migration

flows with data on the universe of consular identification cards issued by the Mexican government to its nationals residing in the United States during 2008–2010. Consular cards are used by immigrants to obtain driver's licenses in some U.S. states, to access financial services, and for identification purposes. These identifications contain information on the holder's municipality of birth in Mexico and the state of residence in the United States.[16] Aggregating and linking this information at the municipality level allows us to create bilateral migration flows.[17]

Finally, we account for the fact that individuals from any given Mexican municipality migrate to more than one U.S. state. This means that each municipality's observed return migration rate is determined by varying immigration enforcement levels across multiple U.S. states. We, therefore, construct our instrumental variable as the municipality-level exposure to U.S. immigration enforcement by interacting the share of migrants π from Mexican municipality m residing in each U.S. state s with the corresponding state's total enforcement score:

$$Immigration\ Enforcement_{mt} = \sum_{s \in S}^{S} (\pi_m^s \times Total\ Enforcement_{st}), \quad \sum_{s \in S}^{S} \pi_m^s = 1. \qquad \text{(A3)}$$

A potential empirical challenge to using consular cards to create bilateral migration flows is that they are not mandatory, and thus not every migrant has one. In fact, out of

[16]The information is verified during the application process by requiring individuals to present a form of identification issued in Mexico, such as a passport or a birth certificate, and a proof of residence, like a rental lease contract or a utility bill (Secretaría de Relaciones Exteriores, 2015).

[17]For municipalities with fewer than 100 consular cards, we impute the shares of the Mexican state where the municipality is located.

the approximately 12 million Mexican-born immigrants estimated to be living in the U.S. in 2010, we have information on 2.3 million consular cards, which corresponds to roughly 20% of the Mexican immigrant population. We therefore verify that the distribution of these IDs reflects the true distribution of Mexicans living in the US. If consular cards do not reflect the underlying locational distribution of the Mexican immigrant population, our bilateral migration flows would be biased. To gauge the correlation between both distributions, we compare each state's share of consular cards to its share of the non-US citizen Mexican population in 2000 and 2010. We compute the non-US-citizen Mexican population share in each U.S. state using a 5-percent census sample for 2000 and the American Community Survey (ACS) 5-year sample for 2010. Figure A4 indicates that the two measures of migrants' geographic distribution are strongly and positively correlated in both years ($R^2 > 0.96$), with the direct relationship falling on the 45°-line of equality. Parameterizing the correlation using OLS supports the existence of a statistically significant unitary elasticity. This analysis is similar to Caballero et al. (2018), in which the authors also find evidence of a strong correlation between the distribution of the Mexican immigrant population obtained with consular cards and alternative data sources.

Tables

Table A1: Data definitions and sources

Variable	Definition	Source
Social Lag Index	A standardized multidimensional development index that captures education, healthcare, housing, and assets (see Table A2).	National Council for the Evaluation of Social Development Policy (CONEVAL)
Food poverty	Proportion of households in a Mexican municipality unable to acquire a basic food basket, even if they were to allocate all of their income toward buying goods in the basket.	National Institute for Federalism and Municipal Development (INAFED)
Capability poverty	Proportion of households unable to acquire a food basket and make necessary expenses in health and education.	National Institute for Federalism and Municipal Development (INAFED)
Labor outcomes	Proportion of individuals aged 15 and older working in the primary, secondary, and tertiary sectors, respectively.	National Institute for Federalism and Municipal Development (INAFED)
Development outcomes	Real GDP per capita, proportion of the population without access to public health care services, and share of individuals aged 15 and above with complete basic education.	National Institute for Federalism and Municipal Development (INAFED)
Return migration	Percent of households with at least one return migrant out of the total number of households in a Mexican municipality $\frac{Hhs\ with\ return\ migration_{mt}}{Total\ number\ of\ households_{mt}} \times 100$	National Population Council (CONAPO)
Migration	Percent of households with at least one migrant out of the total number of households in a Mexican municipality; estimated analogously to return migration.	National Population Council (CONAPO)
Remittances	Percent of households receiving remittances out of the total number of households in a Mexican municipality; estimated analogously to return migration.	National Population Council (CONAPO)
Municipal and population characteristics	Includes an indicator for rural status, proportion of indigenous population, population size, and homicide rates per 100,000 population.	National Institute for Federalism and Municipal Development (INAFED) and National Institute of Statistics and Geography (INEGI)
US interior immigration enforcement	Activation status of four U.S. immigration enforcement policies: Secure Communities, the task force and jail variations of 287(g) agreements, and E-Verify mandates.	Urban Institute

Table A2: SLI Indicators

	2000	2010
Education		
Illiterate population aged 15 and over (%)	0.100	0.071
	(0.093)	(0.071)
Pop. 6–14 not attending school (%)	0.078	0.046
	(0.043)	(0.022)
Pop. 15+ with incomplete basic education (%)	0.535	0.416
	(0.172)	(0.152)
Healthcare		
Pop. without access to healthcare services (%)	0.570	0.338
	(0.198)	(0.115)
Housing		
Dwellings with dirt floor (%)	0.147	0.064
	(0.179)	(0.076)
Dwellings without a toilet (%)	0.148	0.049
	(0.133)	(0.071)
Dwellings without piped water (%)	0.164	0.117
	(0.173)	(0.150)
Dwellings without drainage (%)	0.231	0.095
	(0.242)	(0.149)
Dwellings without electricity (%)	0.053	0.019
	(0.086)	(0.039)
Assets		
Dwellings without a washing machine (%)	0.494	0.346
	(0.243)	(0.204)
Dwellings without a refrigerator (%)	0.330	0.189
	(0.241)	(0.175)

Note: The Social Lag Index (SLI) combines the eleven indicators shown in the table into a single composite index, where SLI$\sim \mathcal{N}(0,1)$. Positive values indicate a greater lag than the national average and negative values a lower lag. Standard deviations in parentheses.

Table A3: Descriptive Statistics

	2000		2010		Pooled	
	Mean	SD	Mean	SD	Min.	Max.
Main outcome of interest						
Social Lag Index	-1.07	(1.04)	-0.87	(0.84)	-2.38	4.25
Key independent variable						
Households with return migration (%)	0.01	(0.01)	0.02	(0.02)	0.00	0.18
Controls						
Households with intl. migration (%)	0.04	(0.05)	0.02	(0.02)	0.00	0.47
Households receiving remittances (%)	0.04	(0.05)	0.04	(0.04)	0.00	0.54
Municipality indigenous pop. (%)	0.07	(0.18)	0.07	(0.17)	0.00	1.00
Rural municipality (1=yes)	0.22	(0.41)	0.17	(0.37)	0.00	1.00
Homicides rate per 100,000 pop.	10.9	(11.0)	22.9	(42.8)	0.0	2269.2
Nearest neighbors' SLI	-0.93	(0.95)	-0.79	(0.79)	-2.19	3.07
Total population	39,918	(119,450)	45,883	(133,159)	93	1,815,786
Additional outcomes						
Pop. 15+ employed in primary sector (%)	0.18	(0.22)	0.15	(0.20)	0.00	0.98
Pop. 15+ employed in secondary sector (%)	0.28	(0.11)	0.24	(0.09)	0.00	0.88
Pop. 15+ employed in tertiary sector (%)	0.51	(0.17)	0.59	(0.17)	0.01	0.86
Pop. with no access to health care (%)	0.57	(0.20)	0.34	(0.12)	0.01	1.00
School attendance rate (6-14)	0.92	(0.04)	0.95	(0.02)	0.44	1.00
Pop. 15+ with complete basic education (%)	0.47	(0.17)	0.58	(0.15)	0.01	0.90
Adult literacy rate (15+)	0.90	(0.09)	0.93	(0.07)	0.25	0.99
GDP per capita (2005 USD)	12,881	(6,523)	14,708	(6,538)	1,324	47,249
Observations	2,442		2,442		4,884	

Note: Thirteen new municipalities were created between 2000 and 2010, but we restrict the sample to those observed in both periods. With the exception of total population, the means in the table are weighted by municipality population.

Table A4: U.S. State Characteristics and Immigration Enforcement

	Coefficient (SE)	Coefficient (SE)
Industry location quotients		
Natural resources and agriculture	0.051	-0.148*
	(0.037)	(0.085)
Construction	0.065	-0.244
	(0.087)	(0.165)
Manufacturing	-0.063	-0.058
	(0.047)	(0.051)
Wholesale and retail trade, transportation, and utilities	0.004	0.183
	(0.052)	(0.127)
Leisure and Hospitality	0.021	0.102*
	(0.023)	(0.052)
Education and health	-0.134***	0.217
	(0.033)	(0.143)
Economic characteristics		
Unemployment rate (%)	0.231***	0.205**
	(0.085)	(0.094)
Poverty rate (%)	0.096	-0.007
	(0.057)	(0.096)
Elected officials' political party		
Republican governor	0.182***	0.187**
	(0.039)	(0.082)
Republican governor, house, and senate	0.153	0.223
	(0.144)	(0.153)
Law enforcement and crime rates		
Law enforcement officers per 1,000 population	-0.021	0.006
	(0.041)	(0.058)
Hate crimes per 100,000 population	-0.003	-0.210***
	(0.071)	(0.053)
Violent crimes per 100,000 population	0.053*	-0.274***
	(0.029)	(0.047)
Demographic characteristics		
Hispanic population (%)	0.483***	0.100
	(0.062)	(0.139)
Mexican population (%)	0.617***	0.553***
	(0.096)	(0.141)
Non-citizen population (%)	0.401***	-0.497**
	(0.029)	(0.216)
Non-citizen Mexican population (%)	0.562***	0.009
	(0.060)	(0.193)
State FE	N	Y
Observations	102	102

Note: To conduct this exercise, we assemble a state×year two-period panel for 2000 and 2010 with data on industry concentration and unemployment rates from the U.S. Bureau of Labor Statistics,

the political affiliation of state governors from the National Governors Association, the partisan composition of state legislatures from the National Conference of State Legislatures, population characteristics from the American Community Survey (ACS), unemployment and poverty rates from the Census Bureau, and law enforcement and crime rates from the FBI annual reports. The earliest available data for industry composition corresponds to 2001. The coefficients in the table were estimated by running separate regressions for each standard residualized state-specific characteristic on the standard residualized immigration enforcement score Mexicans were exposed to for 2000 and 2010. The immigration enforcement score ranges from 0 (no immigration enforcement policies) to 1 (all immigration policies in place). The location quotients indicate the state-specific distribution of employment in a particular industry relative to the entire country. Hate crime categories are defined by the FBI's Uniform Crime Reporting Program (UCR) in its annual Hate Crime Statistics report. See: `https://www.fbi.gov/services/cjis/ucr/hate-crime`. Violent crimes include murder, forcible rape, robbery, and aggravated assault. Standard errors clustered at the state level in parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table A5: Impact of Return Migration on Social Lag Index (2000-2010)

	2SLS					OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Households with return migration (%)	-0.118***	-0.112***	-0.112***	-0.108***	-0.108***	-0.063***
	(0.0162)	(0.0155)	(0.0152)	(0.0150)	(0.0001)	(0.0080)
Households with intl. migrants (%)		0.001	0.004	0.004	0.004	0.013***
		(0.0035)	(0.0035)	(0.0035)	(0.0035)	(0.0036)
Households receiving remittances (%)		0.005	0.003	0.003	0.003	-0.007**
		(0.0040)	(0.0039)	(0.0039)	(0.0039)	(0.0036)
Rural municipality			0.091**	0.078**	0.078**	0.103***
			(0.0379)	(0.0377)	(0.0377)	(0.0364)
Share of indigenous population			0.029***	0.028***	0.028***	0.029***
			(0.0059)	(0.0058)	(0.0058)	(0.0054)
Total population (log)			-0.097	-0.093	-0.093	-0.076
			(0.0913)	(0.0910)	(0.0910)	(0.0942)
Homicide rate (log)				-0.005	-0.005	-0.002
				(0.0093)	(0.0093)	(0.0092)
Nearest neighbors' SLI				0.107**	0.107**	0.138**
				(0.0526)	(0.0526)	(0.0546)
Industry-specific location quotients	N	N	N	Y	Y	Y
Municipality FE	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y
SEs on return migration and the IV	Cluster	Cluster	Cluster	Cluster	AKM	Cluster
Observations	4884	4884	4884	4884	4884	4884
First-Stage IV						
US immigration enforcement	1.021***	1.574***	1.574***	1.551***	1.551***	–
Cluster-robust standard error	0.057	0.075	0.075	0.076	0.001	–
Kleibergen-Paap LM stat for underid.						
χ^2	133.85	154.71	153.92	150.35	150.35	–
p-value	0.001	0.001	0.001	0.001	0.001	–
Kleibergen-Paap Wald F-stat for weak IVs	324.84	441.08	435.41	418.06	418.06	–
Montiel Olea & Pflueger (2013) effective F-stat	162.39	220.40	217.43	208.42	208.42	–

Note: The dependent variable is the municipality-level social lag index. Our independent variable of interest, return migration, is defined as the share of households in a municipality with a return migrant. The coefficient on return migration indicates the standard-deviation change in the SLI with a one-percentage-point increase in return migration: $\beta = \Delta\sigma_{SLI}$. All model specifications include municipality and state-year fixed effects. Standard errors in parentheses in columns (1)–(4) and (6) are clustered at the municipality level. In column (5), the standard errors on return migration and the instrumental variable are adjusted following Adão et al. (2019). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A6: 2SLS Estimates: Return Migration on SLI with Different Model Specifications (2000-2010)

	(1)	(2)	(3)	(4)
Households with return migration (%)	-0.121***	-0.107***	-0.117***	-0.108***
	(0.0156)	(0.0141)	(0.0147)	(0.0150)
Households with intl. migrants (%)		0.005*		0.004
		(0.0030)		(0.0035)
Households receiving remittances (%)			0.006	0.003
			(0.0035)	(0.0039)
Rural municipality	0.069*	0.079**	0.073*	0.078**
	(0.0381)	(0.0376)	(0.0377)	(0.0377)
Share of indigenous population	0.028***	0.028***	0.028***	0.028***
	(0.0060)	(0.0058)	(0.0060)	(0.0058)
Total population (log)	-0.103	-0.097	-0.090	-0.093
	(0.0902)	(0.0905)	(0.0907)	(0.0910)
Homicide rate (log)	-0.007	-0.005	-0.006	-0.005
	(0.0095)	(0.0093)	(0.0094)	(0.0093)
Nearest neighbors' SLI	0.101*	0.108**	0.103**	0.107**
	(0.0526)	(0.0526)	(0.0526)	(0.0526)
Industry-specific location quotients	Y	Y	Y	Y
Municipality FE	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y
Observations	4884	4884	4884	4884
R^2	0.111	0.137	0.120	0.134

Notes: The dependent variable is the municipality-level social lag index. All model specifications include municipality and state-year fixed effects. Standard errors clustered at the municipality level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A7: 2SLS Estimates of the Impact of Return Migration on Alternative and Placebo Development Measures

Panel A: Alternative development measures (2000-2010)

	Food poverty				Capability poverty			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Households with return migration (%)	-0.018***	-0.016***	-0.015***	-0.014***	-0.016***	-0.012***	-0.011***	-0.010***
	(0.0020)	(0.0021)	(0.0021)	(0.0021)	(0.0020)	(0.0020)	(0.0020)	(0.0020)
Migration and remittances	N	Y	Y	Y	N	Y	Y	Y
Rural status	N	Y	Y	Y	N	Y	Y	Y
Demographic characteristics	N	N	Y	Y	N	N	Y	Y
Homicides and nearest neighbors' development	N	N	N	Y	N	N	N	Y
Industry-specific location quotients	N	N	N	Y	N	N	N	Y
Dependent variable mean	0.220	0.220	0.220	0.220	0.291	0.291	0.291	0.291
Observations	4884	4884	4884	4884	4884	4884	4884	4884

Panel B: Placebo development measures (1990-2000)

	Food poverty				Capability poverty			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Households with return migration (%)	-0.003	0.001	-0.000	-0.001	-0.004*	-0.000	-0.002	-0.003*
	(0.0021)	(0.0019)	(0.0019)	(0.0019)	(0.0022)	(0.0020)	(0.0020)	(0.0020)
Migration and remittances	N	Y	Y	Y	N	Y	Y	Y
Rural status	N	Y	Y	Y	N	Y	Y	Y
Demographic characteristics	N	N	Y	Y	N	N	Y	Y
Homicides and nearest neighbors' development	N	N	N	Y	N	N	N	Y
Industry-specific location quotients	N	N	N	Y	N	N	N	Y
Dependent variable mean	0.237	0.237	0.237	0.237	0.307	0.307	0.307	0.307
Observations	4884	4884	4884	4884	4884	4884	4884	4884

Note: In this table, the dependent variables are the incidence of food poverty and capability poverty. Food poverty measures the proportion of households in a municipality that are unable to cover a basic food basket. Capability poverty captures the share of households in a municipality that are unable to acquire a food basket and make necessary expenses in health and education. In panel A, the dependent variables and return migration rates are contemporaneous, corresponding to 2000 and 2010. In panel B, we conduct a placebo test by repeating the analysis using lagged values for food poverty and capability poverty from 1990 and 2000. All model specifications include municipality and state-year fixed effects. Robust standard errors clustered at the municipality level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Heterogeneity: 2SLS Estimates of the Impact of Return Migration on SLI with Different Municipality Sub-Samples (2000-2010)

	Rural areas		Excl. border region		Excl. neg. return migration		Excl. remitt. outliers	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Households with return migration (%)	-0.045***	-0.046***	-0.118***	-0.113***	-0.114***	-0.109***	-0.126***	-0.113***
	(0.0114)	(0.0103)	(0.0170)	(0.0155)	(0.0151)	(0.0151)	(0.0178)	(0.0147)
Households with intl. migrants (%)		0.001		0.002		0.003		0.002
		(0.0029)		(0.0036)		(0.0036)		(0.0046)
Households receiving remittances (%)		0.001		0.003		0.002		0.007
		(0.0032)		(0.0040)		(0.0039)		(0.0056)
Rural municipality		0.019		0.068*		0.069*		0.097**
		(0.0290)		(0.0375)		(0.0382)		(0.0413)
Share of indigenous population		0.010**		0.026***		0.028***		0.028***
		(0.0048)		(0.0059)		(0.0059)		(0.0061)
Total population (log)		-0.010		-0.113		-0.124		-0.113
		(0.0844)		(0.1103)		(0.0924)		(0.0921)
Homicide rate (log)		-0.001		-0.002		-0.003		-0.006
		(0.0059)		(0.0103)		(0.0097)		(0.0105)
Nearest neighbors' SLI		0.105*		0.116**		0.105**		0.110**
		(0.0549)		(0.0550)		(0.0533)		(0.0557)
Industry-specific location quotients	N	Y	N	Y	N	Y	N	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	4226	4226	4332	4332	4656	4656	4180	4180
First-Stage IV								
US immigration enforcement	0.852***	1.377***	1.028***	1.557***	1.111***	1.572***	1.014***	1.733***
Cluster-robust standard error	0.061	0.080	0.060	0.080	0.053	0.075	0.070	0.101
Kleibergen-Paap LM stat for underid.								
χ^2	127.57	165.31	119.96	137.17	144.00	149.13	120.77	144.85
p-value	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Kleibergen-Paap Wald F-stat for weak IVs	198.43	296.35	291.88	374.86	442.18	439.63	210.50	294.10
Montiel Olea & Pflueger (2013) effective F-stat	99.14	147.60	145.90	186.81	221.04	219.14	105.22	146.55

Note: The dependent variable is the municipality-level social lag index. All model specifications include municipality and Mexican state-year fixed effects. Specifications (1) and (2) restrict the sample to rural municipalities, specifications (3) and (4) exclude municipalities located in states adjacent to the US-Mexico border, specifications (5) and (6) exclude municipalities with a negative change in return migration rates between 2000 and 2010, and specifications (7) and (8) exclude municipalities with a remittance reception rate in 2010 one standard deviation above the national mean. Robust standard errors clustered at the Mexican municipality level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A9: 2SLS: Return Migration on Additional Dimensions of Developmment (2000-2010)

Panel A: Income and Labor								
	Income per capita (log)		Primary sector		Secondary sector		Tertiary sector	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hhs with return migration (%)	0.014	0.021**	-0.001	-0.002	0.004***	0.003**	-0.003*	-0.0001
	(0.0093)	(0.0083)	(0.0016)	(0.0016)	(0.0013)	(0.0012)	(0.0015)	(0.0014)
Municipality controls	N	Y	N	Y	N	Y	N	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Dependent variable mean	9.403	9.403	0.171	0.171	0.257	0.257	0.551	0.551
Observations	4836	4836	4884	4884	4884	4884	4884	4884
Panel B: Health and Education								
	No access to health care		School attend. (6-14)		Complete basic educ. (age:15+)		Literacy rate (15+)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hhs with return migration (%)	-0.067***	-0.059***	0.007***	0.007***	0.006***	0.006***	0.003***	0.006***
	(0.0050)	(0.0052)	(0.0008)	(0.0008)	(0.0009)	(0.0009)	(0.0007)	(0.0007)
Municipality controls	N	Y	N	Y	N	Y	N	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Dependent variable mean	0.455	0.455	0.938	0.938	0.523	0.523	0.914	0.914
Observations	4884	4884	4884	4884	4884	4884	4884	4884
Panel C: Additional Outcomes								
	Migration rate		Remittances rate		Trade openness		Voter turnout	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hhs with return migration (%)	-0.028***	-0.029***	-0.006***	-0.007***	-0.029**	-0.032**	0.017***	0.015***
	(0.0021)	(0.0022)	(0.0015)	(0.0015)	(0.0121)	(0.0139)	(0.0017)	(0.0018)
Municipality controls	N	Y	N	Y	N	Y	N	Y
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
State-year FE	Y	Y	Y	Y	Y	Y	Y	Y
Dependent variable mean	0.032	0.032	0.041	0.041	0.264	0.264	0.635	0.635
Observations	4884	4884	4884	4884	4884	4884	4856	4856

Note: All model specifications include municipality and state-year fixed effects. In panel A, the dependent variable in columns (1) and (2) is the log income per capita and in columns (3)–(8) is the percent of individuals aged 15 and older working in the primary, secondary, and tertiary sectors. The primary sector includes fishing, agriculture, livestock, and forestry. The secondary sector consists of mining, oil exploitation, and manufacturing; and the tertiary sector involves tourism, commerce, financial services, and the communications sector. In panel B, the dependent variable in columns (1) and (2) is the proportion of the population without access to public health care services. In columns (3) and (4), it is the school attendance rate among children aged 6-14, in columns (5) and (6) is the share of individuals aged 15 and above with complete basic education, and in columns (7) and (8) is the adult literacy rate. In panel C, columns (1) and (2), the dependent variable is the municipality-level migration rate. In columns (3) and (4), we model the impact on the remittances reception rate. In columns (5) and (6), the dependent variable is the trade openness index calculated as $(exports + imports)/GDP$. Columns (7) and (8) estimate the impact of return migration on voter turnout during the presidential elections of 2000 and 2012. Robust standard errors clustered at the municipality level in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

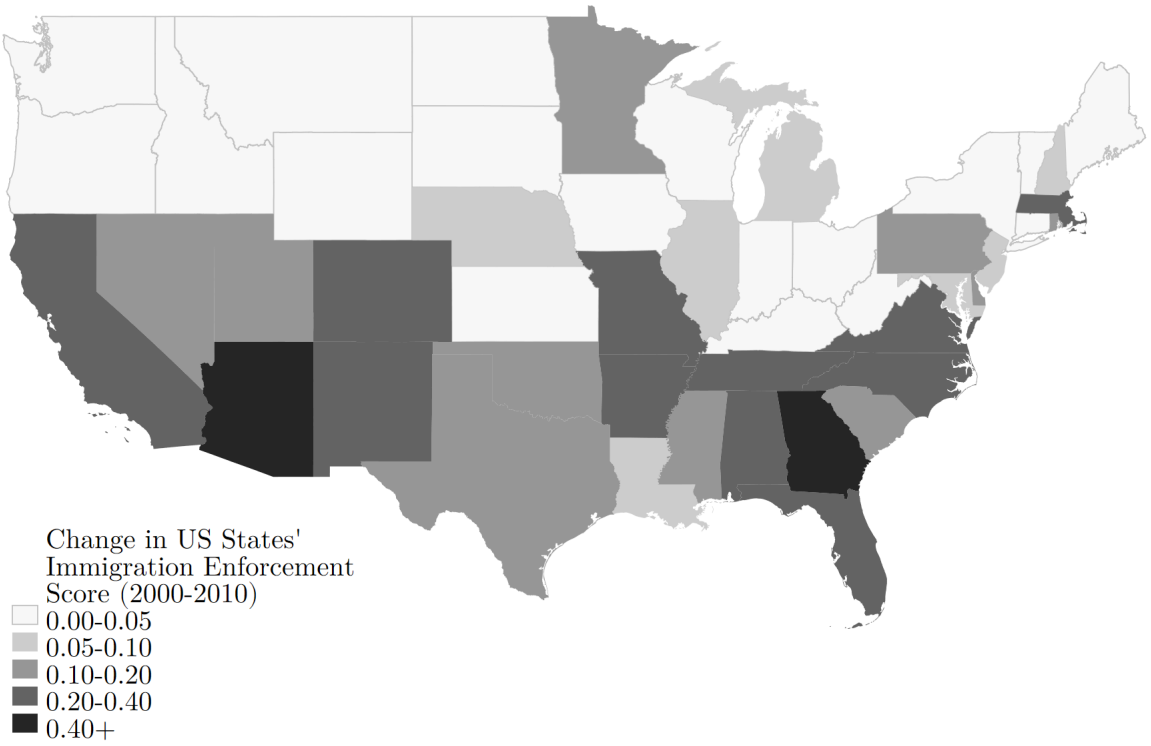
Figures

Figure A1: Active Immigration Enforcement Policies by U.S. State and Year (2005-2010)



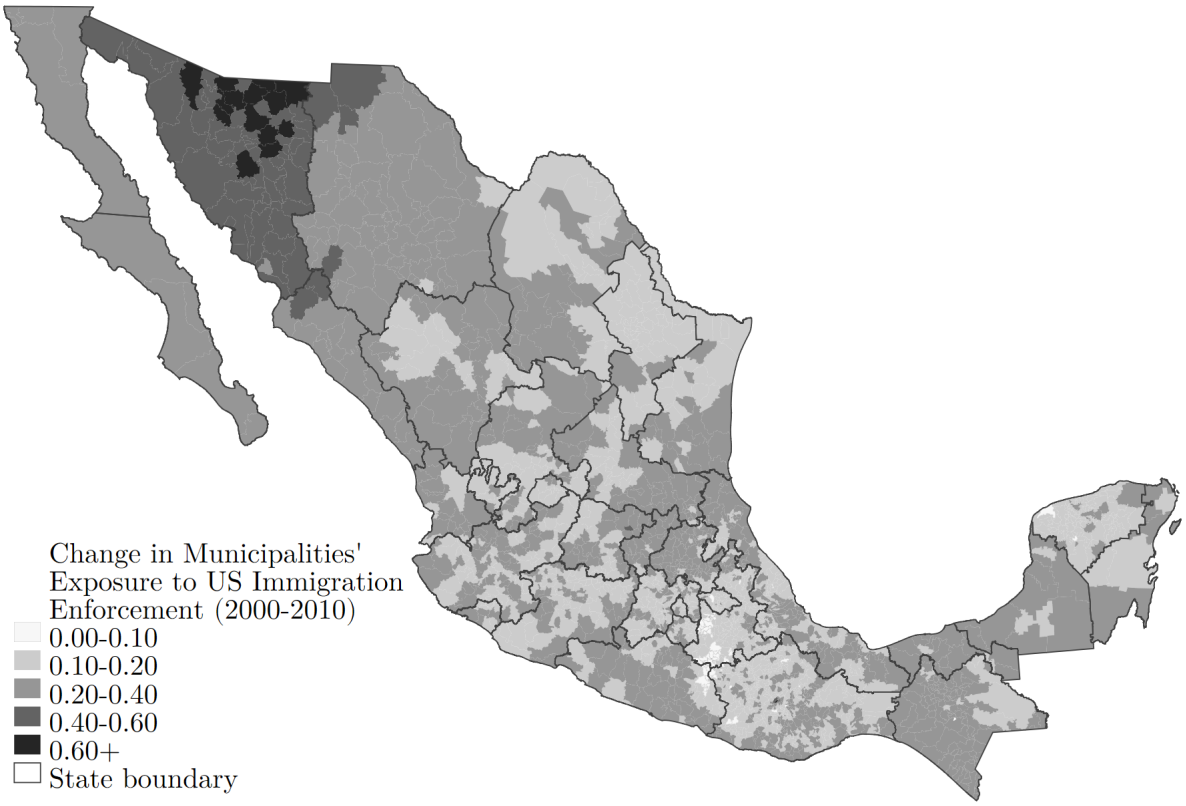
Note: The four interior immigration enforcement policies include Secure Communities, the taskforce and jail variations of 287(g) agreements, and E-Verify mandates. A policy is considered active when a U.S. state or any of its constituent jurisdictions has adopted or is covered by the measure. In estimating our instrumental variable, the policy indicator equals zero if the policy was not active, 0.5 if it covered most counties in the state, and one if it covered the entire state. We dichotomize the policy indicator in this figure for ease of exposition.

Figure A2: Change in U.S Immigration Enforcement, by State (2000-2010)



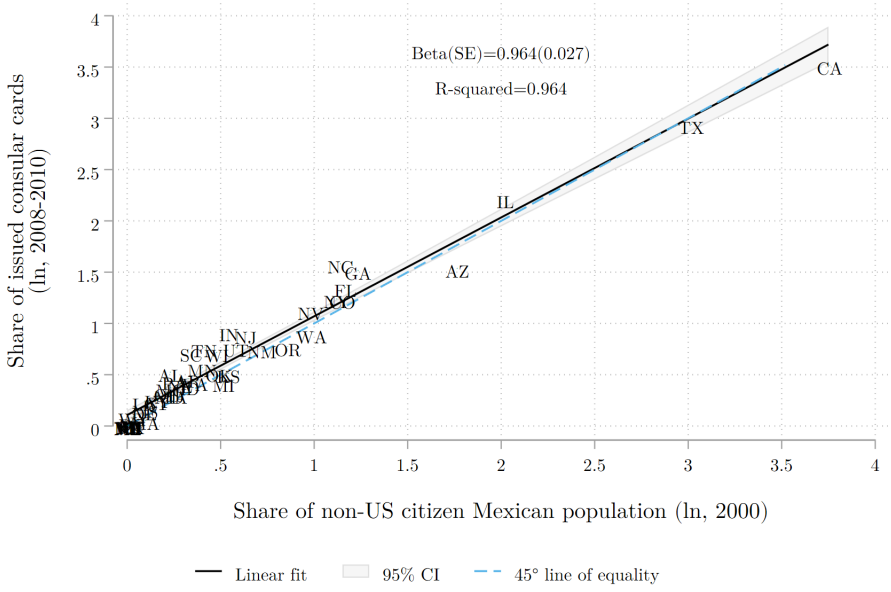
Note: The figure shows the state-specific change in U.S. immigration enforcement policies between 2000 and 2010. A value of 0 indicates no active policy, and a value of 1 indicates that all immigration enforcement policies considered in the study were active throughout the entire period.

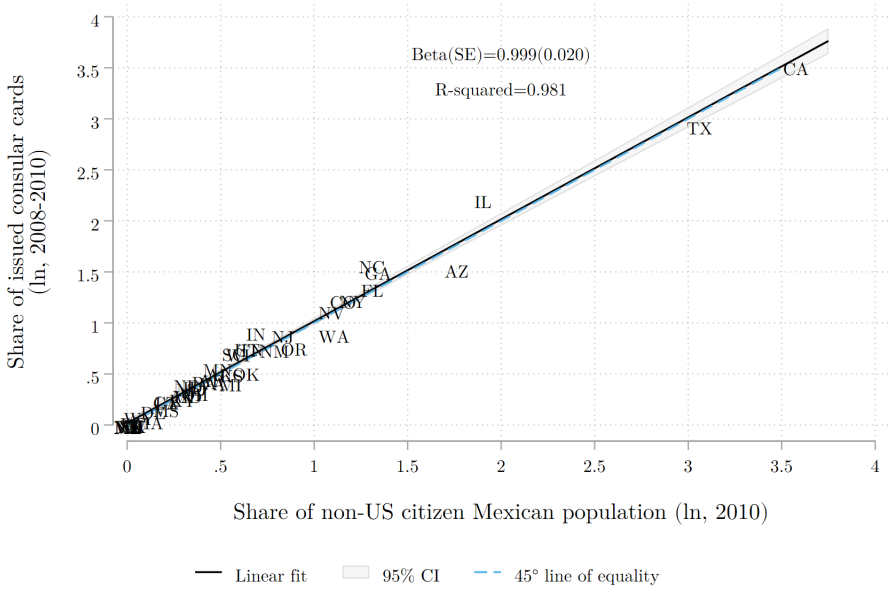
Figure A3: Change in Mexican Migrants' Exposure to U.S Immigration Enforcement, by Municipality of Origin (2000-2010)



Note: The figure shows the municipality-specific change in U.S. immigration enforcement policies during 2000–2010 to which migrants were exposed. A value of 0 indicates that migrants from a given municipality were not exposed to any U.S. immigration enforcement policies, while a value of 1 indicates that migrants were exposed to all immigration enforcement policies considered in the study.

Figure A4: Distribution of Mexican Migrant Population and Consular Cards by U.S. State





Note: The coefficients and standard errors indicated in the figure correspond to the estimation of the following linear model via OLS: $\ln y_s = \alpha + \beta \ln x_s$, where y is the share of consular cards issued in U.S. state s, and x is the corresponding share of non-US citizen Mexicans living in the state. Data on the state-specific non-US citizen Mexican population comes from the 2000 census and the 2010 ACS.