

# Deportation and Fertility: Evidence from U.S. Immigration Enforcement in Mexico

Julian Diaz-Gutierrez \*      Mary Arends-Kuenning †

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## Abstract

We estimate the effect of U.S. deportations on fertility in Mexican origin municipalities. We exploit the staggered rollout of the Secure Communities program (2008–2014) across U.S. counties, combined with pre-existing migrant network linkages, to construct a shift-share measure of predicted deportation exposure at the municipality level. A one percentage point increase in the predicted deportee share raises the total fertility rate by 0.165, or 7 percent relative to the sample mean. The effect is concentrated among women aged 20–29 and among women in union. Decomposing by birth order, we find that the increase is driven entirely by higher-order births among partnered women, while first births and union formation rates are unaffected. These results point to a reunification mechanism: deportees—96 percent of whom are men of reproductive age—return to partners with whom they already have children, and the couple has an additional child. Female employment rises in response to the shock but earnings do not, consistent with an added worker effect that does not raise the opportunity cost of childbearing. The fertility and labor supply responses are complementary consequences of the same household shock.

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\*Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign.  
Email: [juliand3@illinois.edu](mailto:juliand3@illinois.edu)

†Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign.  
Email: [marends@illinois.edu](mailto:marends@illinois.edu)

# 1 Introduction

Immigration enforcement policies in wealthy destination countries reshape the lives of millions of families in sending countries. When a migrant is deported, the consequences extend beyond the individual: households in origin communities experience changes in partnership structure, economic resources, and the conditions under which fertility decisions are made. Despite the growing scale of deportations from the United States, there is limited evidence on how enforcement-driven return migration affects demographic outcomes in sending countries. This paper estimates the causal effect of U.S. deportations on fertility in Mexico.

The relationship between return migration and fertility is theoretically ambiguous. On one hand, the return of a male partner removes a physical constraint on childbearing for couples that were separated by migration. [Lindstrom and Saucedo \(2002\)](#) document that spousal separation during migration spells reduces birth probabilities in the short run, implying that reunification should reverse this suppression. More broadly, return migrants can transfer fertility norms acquired abroad: [Bertoli and Marchetta \(2015\)](#) show that Egyptian men returning from high-fertility Gulf states have more children than non-migrants, while [Fargues \(2011\)](#) argues that migration to low-fertility European countries accelerates the demographic transition in origin communities. In the case of deportation from the United States—a country with fertility norms similar to Mexico’s—norm transfer is unlikely to be the operative channel. Instead, the key forces are partner availability and household income. Deportation entails a loss of U.S. earnings or remittances, which reduces household resources and may push women into the labor force. In the canonical framework of household time allocation ([Becker, 1965](#)), an increase in the opportunity cost of women’s time would work against fertility. Whether fertility rises or falls thus depends on the nature of the labor market adjustment: if women who enter the labor force do not experience an increase in wages, the substitution effect is muted and the partner availability channel can prevail.

We study these questions in the context of the Secure Communities (SC) program, the largest local immigration enforcement initiative in modern U.S. history. SC was

implemented in a staggered fashion across U.S. counties from 2008 to 2014 and deported over 344,000 Mexican citizens, 96 percent of whom were men of reproductive age. Ninety-three percent of deportees who remained in Mexico returned to their municipalities of origin (Osuna Gomez and Medina Cortina, 2026). The staggered rollout of the program across counties, combined with pre-existing variation in where Mexican municipalities sent their migrants, generates plausibly exogenous variation in the intensity of the deportation shock at the municipality level.

Our empirical strategy exploits this variation through a shift-share design. The shares are the pre-existing geographic distribution of undocumented Mexican migrants across U.S. counties, measured using administrative records from the *Matrículas Consulares de Alta Seguridad* (MCAS) identity card program (Caballero et al., 2018). The shifts are the county-level deportation flows generated by the staggered activation of SC. We combine these to construct a predicted deportation shock for each Mexican municipality and year. We measure fertility outcomes using the universe of birth certificates from Mexico's statistical bureau (INEGI), which we use to compute total fertility rates (TFR), age-specific fertility rates, and birth rates disaggregated by birth order, marital status, and maternal education for a panel of 2,329 municipalities over the period 2005–2015. Our baseline specification includes municipality and state-by-year fixed effects, ensuring that identification comes from within-state, across-municipality variation in deportation exposure. We assess the parallel trends assumption using a distributed-lag model following Schmidheiny and Siegloch (2023), and find no evidence of differential pre-trends.

We document three sets of results. First, the deportation shock increases the total fertility rate: in the preferred specification, a one percentage point increase in the predicted deportee share raises the TFR by 0.165, or approximately 7 percent relative to the sample mean. The effect is concentrated among women aged 20–29 and is robust across specifications that include municipality-specific trends, baseline characteristics interacted with year dummies, and state-by-year fixed effects.

Second, using birth records disaggregated by birth order and marital status, we

show that the fertility increase is driven entirely by higher-order births among women in existing partnerships—not by first births or new union formation. This points to a reunification mechanism in which deportees return to partners with whom they already have children, and the couple has an additional child. Third, long-difference regressions using census microdata reveal that female employment rises but earnings do not, consistent with an added worker effect in which women enter the labor force to compensate for lost remittance income. Because wages do not increase, the opportunity cost of childbearing remains unchanged, and the labor supply response does not suppress fertility.

A growing literature examines the consequences of U.S. immigration enforcement. Within the United States, researchers have documented effects of the SC program on safety net participation (Alsan and Yang, 2024), labor markets (East et al., 2023), immigrant fertility (Amuedo-Dorantes and Arenas-Arroyo, 2021), and marriage patterns (Amuedo-Dorantes et al., 2020). On the origin-country side, an expanding body of work traces the transnational effects of SC-driven return migration on Mexican firms (Osuna Gomez and Medina Cortina, 2026), educational investments in sending communities (Caballero, 2022), local economic development (Bucheli and Fontenla, 2022), and violent crime (Ambrosius, 2025). A related literature studies how migration affects sending-country outcomes more broadly, including child health (Hildebrandt and McKenzie, 2005), children’s education (Nobles, 2011), and human capital formation (Batista et al., 2012). We make three contributions relative to this body of work. First, we provide the first causal estimates of how enforcement-driven return migration affects fertility in sending countries. The distinction from voluntary return matters because deportees differ in their demographic composition, the abruptness of the return, and the loss of U.S. labor income without planned savings or remittance adjustments. Second, we identify the specific margin through which fertility responds. Using administrative birth records with information on birth order and marital status, we decompose the fertility increase into extensive and intensive margins and show that it is driven by the reunification of existing couples rather than new

family formation. Third, we document how the fertility and labor market responses to deportation are jointly determined. The finding that female employment rises without a corresponding increase in earnings resolves an apparent puzzle—how fertility can increase at the same time that women are entering the labor force—and connects the immigration enforcement literature to the economics of fertility by showing that the added worker effect need not suppress childbearing when the opportunity cost of time remains unchanged.

The paper proceeds as follows. Section 2 describes the SC program and its implications for Mexican origin communities. Section 3 presents the data sources and sample construction. Section 4 describes the empirical strategy. Section 5 reports the main results. Section 6 investigates the mechanisms underlying the fertility response. Section 7 concludes.

## **2 The Secured Communities program**

The SC program was an immigration enforcement initiative administered by U.S. Immigration and Customs Enforcement (ICE) from 2008 to 2014.<sup>1</sup> Under SC, fingerprints collected during booking at local jails were sent to the FBI and automatically forwarded to the Department of Homeland Security, where they were compared against its Automated Biometric Identification System. If there was a fingerprint match and probable cause for removability, ICE issued a detainer requesting that law enforcement hold the individual for up to 48 hours to allow ICE to assume custody for removal proceedings. Prior to SC, noncitizens were identified through inmate interviews under the Criminal Alien Program or through 287(g) agreements, which covered less than 15 percent of local jails in approximately 2 percent of U.S. counties.

SC was activated in a staggered fashion across U.S. counties beginning on October 27, 2008, with full nationwide coverage achieved on January 22, 2013 (Miles and Cox, 2014). Figure 1 shows the cumulative set of U.S. counties that had activated SC by the

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<sup>1</sup>This section draws primarily on Alsan and Yang (2024), Caballero et al. (2018), and Osuna Gomez and Medina Cortina (2026).

end of each year from 2008 to 2013.

Between 2008 and 2015, over 344,000 Mexican citizens were deported under SC. Approximately 78 percent of all SC deportees were Mexican, 96 percent were men, and about half were between the ages of 24 and 35. Nearly half of all Mexican deportations were for non-criminal offenses or minor violations. Deportees had less education than voluntary return migrants, and both groups had less education than the general Mexican male population.

Only 10 percent of deportees planned to return to the United States, and 93 percent of those who remained in Mexico resided in their communities of origin. The high rate of return to origin municipalities reflects both the cost of unauthorized border crossing, and the availability of family networks in origin communities. After deportation, an individual is no longer permitted to enter the United States legally, making re-migration difficult in the short term.

These facts have two implications for fertility in origin municipalities. First, the return of men, who constitute 96 percent of deportees and are predominantly of reproductive age, increases the pool of potential or existing partners in origin communities. Second, the loss of U.S. earnings or remittances alters household economic conditions. Whether fertility rises or falls in response depends on the relative strength of these channels, which we investigate empirically in Section 6.

### 3 Data

This section describes the data sources used to study the effect of U.S. deportations on fertility in Mexico. The analysis combines administrative records on births, population estimates, deportation data, and migrant network information to construct a municipality-level panel spanning 2005 to 2015.

**Vital records:** Data on live births come from the universe of annual birth certificates collected by Mexico's statistical bureau, the *Instituto Nacional de Estadística y Geografía* (INEGI).<sup>2</sup> These data contain information on each registered birth, including the date

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<sup>2</sup>Birth registration completeness reached 95 percent nationally by 2015, with coverage exceeding

of birth, the mother’s municipality of residence, age, marital status, education level, and the birth order of the child. The main limitation is late registration: approximately 30 percent of births are recorded after the calendar year of occurrence. We address this issue by adjusting the timing of births to the estimated date of conception<sup>3</sup> and by allowing for a two-year window for late registrations.

We compute the total fertility rate (TFR), which summarizes the fertility experience of a synthetic cohort of women by aggregating age-specific fertility rates across all reproductive age groups. It represents the average number of children a woman would have over her lifetime if she experienced current age-specific fertility rates at each age. It is not affected by differences in the age composition of the female population across municipalities, unlike the crude birth rate. We calculate the TFR as follows:

$$TFR = 5 \times \sum_{a=15-19}^{40-44} g_a, \quad \text{where } g_a = \frac{\text{Births of women in age range } a}{\text{Total women in age range } a} \quad (1)$$

Where  $g_a$  is the age-specific fertility rate (ASFR) for women in age group  $a$ .<sup>4</sup> Municipal-level population estimates by sex and five-year age group come from the Consejo Nacional de Población (CONAPO), which provides annual intercensal projections for all Mexican municipalities.

We also construct birth rates per 100 women aged 15–49, disaggregated by marital status (single, married, cohabiting in *unión libre*), education level (primary or less, secondary, tertiary), and birth order (first births versus higher-order births). These measures use the total number of women aged 15–49 as a common denominator across all subgroups.

**Deportation data:** Data on deportations under the SC program come from the Transactional Records Access Clearinghouse (TRAC) at Syracuse University. TRAC compiles case-level records from U.S. Immigration and Customs Enforcement (ICE) obtained through Freedom of Information Act requests. We aggregate these records

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93 percent in rural areas. The digitization of the electronic birth certificate across all 32 states further improved data quality and coverage during the period of analysis (Zaragoza-Jiménez et al., 2025).

<sup>3</sup>We approximate the date of conception by subtracting nine months from the recorded date of birth, consistent with the average human gestational period of 40 weeks.

<sup>4</sup>We focus on the following age groups: 15 to 19, 20 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44.

to the U.S. county-by-year level, restricting to removals of Mexican citizens during the SC implementation period (2008–2015).

**Migrant networks:** A central challenge in studying the effects of U.S. deportations on Mexican communities is linking deportees in U.S. counties to their municipalities of origin in Mexico. We address this by using administrative records from the *Matrículas Consulares de Alta Seguridad* (MCAS) identity card program. Issued by Mexican consulates in the United States, the MCAS provides Mexican nationals abroad with a government-issued form of identification that can be used to open bank accounts, obtain driver’s licenses, and access other services. Because documented migrants have access to other forms of identification (e.g., visas, permanent resident cards), the vast majority of MCAS applicants are undocumented (Caballero et al., 2018; Massey et al., 2010). Massey et al. (2010) estimate that 75 to 80 percent of the undocumented Mexican population in the United States possesses an MCAS.

The MCAS records contain two pieces of information that are central to our analysis: the holder’s municipality of birth in Mexico and the U.S. county of residence at the time of issuance. This allows us to observe which Mexican municipalities have stronger migration ties to particular U.S. counties before the implementation of SC.<sup>5</sup> The intuition for using these network data is that migrants from the same municipality tend to cluster in the same U.S. destinations due to established social networks that facilitate the adjustment to life abroad. Consequently, when a U.S. county activates SC and departs Mexican nationals, the affected municipalities are those that sent migrants to that county. The MCAS data allow us to quantify the strength of these transnational linkages.

We use MCAS records from 2005 and 2006 to construct baseline network shares, following Osuna Gomez and Medina Cortina (2026). Using data from both years reduces the risk that a single atypical year drives the network measure. The baseline years precede the SC program (which began in late 2008), ensuring that the network

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<sup>5</sup>Caballero et al. (2018) validate the MCAS data by comparing it to well-known household surveys from both the U.S. and Mexico, and conclude that the distribution of Mexican migrants across U.S. destinations from the MCAS is representative of the overall Mexican population in the United States.

shares are not affected by SC-induced deportations or behavioral responses to the policy. Osuna Gomez and Medina-Cortina (forthcoming) document that 93 percent of deportees who remain in Mexico return to their municipality of origin, based on data from Mexico’s National Survey of Demographic Dynamics (ENADID). This high rate of return to origin communities supports the assumption that MCAS-based network shares are a reliable proxy for predicting where deportees settle upon return. The formal definition of the network share and its role in constructing the treatment variable are described in the empirical strategy section below.

**Census and survey data:** To investigate mechanisms—including union formation, labor market responses, and return migration; we use individual-level microdata from the 2010 Population Census and the 2015 Intercensal Survey, accessed through IPUMS International (Ruggles et al., 2003). These data contain demographic characteristics including age, sex, education, marital status, employment status, class of worker, earnings, and migration history.

## 4 Empirical strategy

### 4.1 Predicted deportations

The treatment variable,  $\psi_{m,t}$ , is a shift-share measure of predicted deportation exposure at the Mexican municipality level. It combines the staggered, county-level implementation of the SC program in the United States with pre-existing migrant network linkages between Mexican municipalities and U.S. counties. The network share for municipality  $m$  in U.S. county  $c$  is defined as:

$$Network_{m,c} = \frac{n_{c,2005-06}^m}{N_{2005-06}^c} \quad (2)$$

where  $n_{c,2005-06}^m$  is the number of MCAS cards issued in county  $c$  to migrants originating from municipality  $m$  in 2005–2006, and  $N_{2005-06}^c$  is the total number of MCAS cards in county  $c$  over the same period. The network share captures the fraction

of the undocumented migrant population in each U.S. county that originates from a given Mexican municipality. Using these network shares, we construct the predicted SC deportation shock as a share of the baseline population in 2005:

$$\psi_{m,t} = \frac{1}{pop_{m,2005}} \sum_c Deportations_{c,t} \times Network_{m,c} \quad (3)$$

where  $Deportations_{c,t}$  denotes the number of Mexican citizens removed from U.S. county  $c$  in year  $t$  under the SC program,  $Network_{m,c}$  is the baseline network share defined in equation (2), and  $pop_{m,2005}$  is the municipal population in 2005 from CONAPO. For analysis purposes, the treatment variable is then expressed in percentage points (deportees per 100 inhabitants) and captures the predicted intensity of deportation exposure based on where a municipality's migrants were located in the United States before SC activation. Municipalities whose migrants were concentrated in counties that activated SC earlier and deported more individuals receive higher values of  $\psi$ . Figure 2 displays the spatial distribution of  $\psi_{m,t}$  across Mexican municipalities for each year from 2008 to 2013. As shown in Table A1, the average treatment intensity in post-SC years is 0.07 percentage points (SD = 0.10).

This shift-share design follows the approach in [Alsan and Yang \(2024\)](#) and [Osuna Gomez and Medina Cortina \(2026\)](#), and exploits two sources of variation: cross-sectional differences in the pre-existing geographic distribution of migrants across U.S. counties (the "shares"), and time-series variation in deportation intensity driven by the staggered rollout of SC (the "shifts").

## 4.2 Baseline specification

We estimate the effect of the predicted deportation shock on fertility using the following specification:

$$Y_{m,t} = \alpha + \beta\psi_{m,t} + \lambda_{s,t} + \gamma_m + \varepsilon_{m,t} \quad (4)$$

Where  $Y_{m,t}$  is the total fertility rate (or age-specific fertility rate, or birth rate) in

municipality  $m$  in year  $t$ ;  $\psi_{m,t}$  is the predicted deportation shock;  $\gamma_m$  are municipality fixed effects, which absorb all time-invariant differences across municipalities; and  $\lambda_{s,t}$  are state-by-year fixed effects, which absorb all time-varying shocks common to municipalities within the same state, such as changes in state-level economic conditions, social programs, or migration policies. This specification ensures that identification comes from within-state, across-municipality variation in deportation exposure. The parameter of interest,  $\beta$ , captures the effect of a one percentage point increase in the predicted deportee share on fertility. Standard errors are clustered at the municipality level.

As robustness checks, we also report specifications that replace state-by-year fixed effects with year fixed effects alone, add municipality-specific linear time trends, or add baseline municipality characteristics from the 2000 Census (education shares, urban share, log population, and initial TFR in 2005) interacted with year dummies.

The analysis sample for the baseline results includes Mexican municipalities observed annually from 2008 to 2015, yielding a panel of 2,329 municipalities and approximately 18,330 municipality-year observations (Table A1). We exclude municipalities with implausible fertility rates ( $TFR$  below 0.5 or above 8), which reflect data errors in the birth or population counts. We also exclude municipalities where the shift-share treatment variable exceeds 1 percentage point per year (i.e., more than one predicted deportee per 100 inhabitants), as these are micro-municipalities where the instrument is mechanically inflated. The treatment variable is winsorized at the top 1 percent of the distribution. Municipalities with fewer than 100 women aged 15–49 are excluded to reduce measurement noise in the fertility rates.

### 4.3 Distributed-lag model

The identifying assumption is that, conditional on fixed effects, the baseline distribution of migrants across U.S. counties is uncorrelated with unobserved municipality-level trends in fertility. To assess the dynamic effects of the deportation shock and to test the parallel trends assumption, we estimate a distributed-lag model following

Schmidheiny and Siegloch (2023):

$$Y_{m,t} = \alpha + \sum_k \beta_k \psi_{m,t-k} + \lambda_{s,t} + \gamma_m + \varepsilon_{m,t} \quad (5)$$

Where the  $\beta_k$  coefficients capture the relationship between deportation exposure and fertility at different leads ( $k < 0$ ) and lags ( $k > 0$ ) relative to the treatment. The model includes two leads and three lags. Following Schmidheiny and Siegloch (2023), we normalize  $\Gamma_{-1} = 0$  and report cumulative effects  $\Gamma_k$ , which represent the total accumulated effect of the deportation shock up to  $k$  periods. For post-treatment periods,  $\Gamma_k = \sum_{j=0}^k \beta_j$ . For pre-treatment periods,  $\Gamma_k = -\sum_{j=k+1}^{-1} \beta_j$ . Under the parallel trends assumption, the pre-treatment cumulative effects should be close to zero and statistically insignificant.

## 5 Results

### 5.1 Baseline results

Table 1 reports the estimated effect of the predicted SC deportation shock on the municipal total fertility rate for the period 2005–2015. Standard errors are clustered at the municipality level.

Column (1) presents the basic specification, including municipality and year fixed effects. The estimated coefficient of 0.224 indicates that a one percentage point increase in the SC deportee share raises the TFR by 0.224, significant at the 1 percent level. This parsimonious specification, however, may be biased by municipality-specific trends correlated with both migration networks and fertility.

To address this concern, Column (2) adds municipality-specific linear time trends, allowing each municipality to follow its own trajectory over the sample period. The coefficient decreases slightly to 0.172 but remains statistically significant at the 5 percent level. Column (3) instead controls for differential trends driven by observable baseline characteristics by interacting 2000 Census variables (education shares, urban share,

log population, and initial TFR in 2005) with year dummies. The estimate of 0.228 is virtually unchanged from the basic specification, suggesting that the treatment is not strongly correlated with these predetermined characteristics.

Column (4) presents the preferred specification, replacing year fixed effects with state-by-year fixed effects. This specification absorbs all time-varying shocks common to municipalities within the same state, ensuring that the identifying variation comes from within-state differences in deportation exposure. The coefficient of 0.165 is the most conservative across all specifications and remains significant at the 5 percent level. This estimate implies that a one percentage point increase in the SC deportee share increases the TFR by 7 percent relative to the sample mean. The stability of the coefficient across demanding specifications supports a causal interpretation, and if anything, unaccounted-for state-level shocks could have biased results upward.

**Age-specific fertility rate:** Table 2 decomposes the fertility effect by age group. Each column reports a separate regression of the age-specific fertility rate on the predicted deportation shock, using municipality and state-by-year fixed effects. The results indicate that the fertility response is concentrated among women aged 20–24 and 25–29. For women aged 20–24, a one percentage point increase in the SC deportee share raises the ASFR by 0.022, representing a 16 percent increase relative to the group mean of 0.133. For women aged 25–29, the estimated effect is 0.015, or 12 percent of the group mean. The coefficients for all other age groups — 15–19, 30–34, 35–39, and 40–44 — are small, statistically insignificant, and show no consistent pattern.

**Birth rate:** while the TFR provides estimates of the average number of children a woman would have over their reproductive life, the crude birth rate allows us to measure the flow of births by year, as well as being able to decompose it by socioeconomic characteristics. Table 3 reports the effect of the deportation shock on the birth rate per 100 women aged 15–49, split by marital status (Panel A) and education level (Panel B). The overall birth rate increases by 1.15 per 100 women. Panel A shows that this effect is driven by women in union (married or cohabiting in *unión libre*), for whom the birth rate rises by 0.72, representing 11 percent of the group mean. The coefficients

for single and formally married women are small and statistically insignificant. Panel B shows that the effect is concentrated among women with secondary education, for whom the birth rate increases by 0.65, or 15 percent of the group mean. No significant effects are found for women with primary education or less, or for women with tertiary education.

## 5.2 Identifying assumption

Figure 3 provides evidence on the validity of the identifying assumption. The parallel trends assumption requires that, in the absence of the SC program, fertility rates would have evolved similarly in municipalities with high and low predicted deportation exposure. While this assumption is inherently untestable, the distributed-lag model allows us to examine whether municipalities that would later receive larger deportation shocks were already on differential fertility trajectories before SC began.

The pre-treatment cumulative effects at  $k = -3$  and  $k = -2$  are close to zero and statistically indistinguishable from it, indicating no evidence of differential pre-trends. The effect emerges at  $k = 0$  and grows through  $k = 1$ , where the cumulative effect peaks at approximately 0.52. This dynamic pattern — flat pre-trends followed by a building post-treatment response — is consistent with a causal effect that materializes with a delay, as would be expected given the approximately nine-month lag between a deportee's return and the birth of a child. The partial fade at  $k = 2$  followed by a recovery at  $k = 3$  suggests that the fertility response is concentrated in the first years after the shock.

## 6 Mechanisms

The baseline results show that the SC deportation shock increases fertility in Mexican origin municipalities. We consider two sets of exercises. First, we use birth order data to determine whether the fertility response reflects new family formation or the expansion of existing families. Second, we examine labor market outcomes to understand why

the simultaneous increase in female employment does not suppress fertility. We then complement these exercises with evidence on return migration and union formation.

## 6.1 Intensive vs extensive margin

Fertility increase reflects new family formation or the expansion of existing families. If deportees form new partnerships upon return, the effect should appear in first births (extensive margin). If instead they reunite with partners with whom they already have children, the effect should appear in higher-order births (intensive margin).

Table 4 tests this distinction. A one percentage point increase in the predicted SC deportee share raises first births by 0.284 per 100 women, but this effect is not statistically significant (Column 1). In contrast, higher-order births increase by 0.870 per 100 women, significant at the 1 percent level (Column 2). Restricting to women in union sharpens the result: a one percentage point increase in the deportee share has no effect on first births among partnered women (Column 3), but raises higher-order births among partnered women by 0.741, significant at the 1 percent level (Column 4). The fertility increase is thus driven entirely by the intensive margin — women who already have at least one child and are in an existing partnership have an additional child upon the return of a partner.

## 6.2 Labor market adjustments

The birth order results establish that the fertility increase operates through existing partnerships. A natural follow-up question is how this increase is compatible with changes in household economic conditions. The deportation shock replaces U.S. earnings or remittances with local labor income, which could affect fertility through changes in female labor supply and the opportunity cost of time. We examine these labor market responses alongside evidence on return migration and union formation.

To estimate these channels, we follow [Pearson \(2026\)](#) and estimate long-difference regressions based on municipality-level data from the 2010 Census and the 2015 Intercensal Survey:

$$\Delta Y_m = \beta \cdot d_m + \alpha_s + X_m' \gamma + \Delta \varepsilon_m \quad (6)$$

where  $\Delta Y_m$  is the 2010-to-2015 change in the outcome (e.g., union rate, employment rate, log earnings),  $d_m$  is the cumulative predicted deportation shock over 2011–2015,  $\alpha_s$  are state fixed effects, and  $X_m$  is a vector of baseline controls measured in the 2010 Census: log working-age population, gender ratio, education shares, age composition, return migrant share, log area, and population growth (2005–2010). Standard errors are clustered at the state level. For the analysis of return migration, we use a cross-sectional regression on the 2015 Intercensal Survey, where the dependent variable is the share of working-age adults (18–54) who reported living in the United States five years earlier (2010).

Table A2 confirms that the deportation shock increases return migration from the United States. A one percentage point increase in the SC deportee share raises the share of male return migrants by 0.750 percentage points, significant at the 1 percent level. The effect is largest among men aged 30–44 (1.045) and those with primary education or less (0.803), consistent with the demographic profile of SC deportees. Female return migration also increases (0.332), though the magnitude is less than half the male effect. These results validate that the shift-share instrument captures actual population movements back to origin municipalities.

Table A3 shows that the deportation shock does not significantly affect union formation. The coefficients on union rates, marriage rates, and cohabitation rates are positive but not statistically significant for either women or men. The sex ratio is also unaffected. The absence of a union formation effect, combined with the birth order results in Table 4, reinforces the interpretation that the fertility increase reflects the reunification of existing couples rather than the creation of new partnerships.

Table 5 reports the effect of the deportation shock on labor market outcomes. A one percentage point increase in the cumulative SC deportee share raises female employment by 0.856 percentage points, significant at the 5 percent level (Panel A). Female earnings, however, do not change. Male employment and earnings are also unaffected

(Panel B). The increase in female employment without a corresponding increase in earnings is consistent with an added worker effect: women enter the labor force to compensate for the loss of remittance income that the household received while the migrant was in the United States. The fact that earnings do not rise indicates that women are not entering higher-paying jobs, and therefore the opportunity cost of their time devoted to childbearing does not increase. This explains why the labor supply response does not suppress fertility — the substitution effect that would discourage childbearing in standard models (Becker, 1965) is not operative when wages remain unchanged.

## 7 Conclusion

This paper estimates the causal effect of U.S. deportations under the Secure Communities program on fertility in Mexican origin municipalities. Exploiting the staggered rollout of SC across U.S. counties and pre-existing migrant network linkages measured through MCAS administrative records, we construct a shift-share measure of predicted deportation exposure for a panel of over 2,300 municipalities between 2005 and 2015.

We find that the deportation shock increases fertility. A one percentage point increase in the predicted deportee share raises the total fertility rate by 0.165 in the preferred specification with municipality and state-by-year fixed effects, representing a 7 percent increase relative to the sample mean. The effect is concentrated among women aged 20–29 and among women in union. A distributed-lag model shows no evidence of differential pre-trends, with the cumulative effect emerging at the time of treatment and peaking one year later—consistent with the biological delay between a deportee’s return and the birth of a child.

Three pieces of evidence point to family reunification as the primary mechanism. First, the fertility increase is driven entirely by higher-order births among partnered women, not by first births or new family formation. Second, union formation rates do not respond to the deportation shock, ruling out the creation of new partnerships as the

channel. Third, the deportation shock increases return migration, particularly among low-educated men aged 30–44—the demographic profile of SC deportees. Together, these results indicate that deportees return to partners with whom they already have children, and the reunited couple has an additional child.

The finding that female employment rises without a corresponding increase in earnings explains why the labor supply response does not suppress fertility. Women enter the labor force to compensate for lost remittance income—an added worker effect—but into work that does not raise their wages. Because the opportunity cost of time devoted to childbearing remains unchanged, the substitution effect that would discourage fertility in standard models is not operative. The fertility and labor supply responses are thus complementary consequences of the same household shock.

These findings have implications for understanding the transnational consequences of immigration enforcement. While prior work has documented effects of SC on firms, education, economic development, and crime in Mexican origin communities, our results show that enforcement also shapes demographic outcomes. The fertility increase we document is not driven by changes in preferences or norms, but by the mechanical reunification of couples separated by migration. This distinction is relevant for policy: enforcement programs that return large numbers of men to sending communities will generate demographic effects regardless of the economic conditions they encounter upon return, as long as existing partnerships are intact.

Several limitations warrant mention. First, our mechanism analysis relies on long-difference regressions using two census cross-sections (2010 and 2015), which limits our ability to trace the timing of labor market and union formation responses as precisely as the fertility outcomes. Second, while we show that the fertility increase operates through higher-order births, we cannot observe whether these births were planned or represent a change in contraceptive behavior. Third, our analysis does not capture potential effects on fertility through changes in remittance flows, as we do not observe remittance amounts at the household level in the census data. Future work could address these questions using household survey data with detailed information on

remittances, contraceptive use, and fertility intentions.

## References

- Alsan, M. and Yang, C. S. (2024). Fear and the Safety Net: Evidence from Secure Communities. *The Review of Economics and Statistics*, 106(6):1427–1441. 4, 5, 10
- Ambrosius, C. (2025). Violent Crime and the Long Shadow of Immigration Enforcement. *Journal of Conflict Resolution*. 4
- Amuedo-Dorantes, C. and Arenas-Arroyo, E. (2021). Immigration Policy and Fertility: Evidence from Undocumented Migrants in the U.S. *Journal of Economic Behavior & Organization*, 189:274–297. 4
- Amuedo-Dorantes, C., Arenas-Arroyo, E., and Wang, C. (2020). Is Immigration Enforcement Shaping Immigrant Marriage Patterns? *Journal of Public Economics*, 190:104242. 4
- Batista, C., Lacuesta, A., and Vicente, P. C. (2012). Testing the ‘brain Gain’ Hypothesis: Micro Evidence from Cape Verde. *Journal of Development Economics*, 97(1):32–45. 4
- Becker, G. S. (1965). A Theory of the Allocation of Time. *The Economic Journal*, 75(299):493–517. 2, 17
- Bertoli, S. and Marchetta, F. (2015). Bringing It All Back Home – Return Migration and Fertility Choices. *World Development*, 65:27–40. 2
- Bucheli, J. R. and Fontenla, M. (2022). The Impact of Return Migration on Economic Development. *The Review of Economics and Statistics*, pages 1–45. 4
- Caballero, M. E. (2022). The Effects of Immigration Enforcement on Educational Investments in Migrants’ Source Regions. 4
- Caballero, M. E., Cadena, B. C., and Kovak, B. K. (2018). Measuring Geographic Migration Patterns Using Matrículas Consulares. *Demography*, 55(3):1119–1145. 3, 5, 8

- East, C. N., Hines, A. L., Luck, P., Mansour, H., and Velásquez, A. (2023). The Labor Market Effects of Immigration Enforcement. *Journal of Labor Economics*, 41(4):957–996. 4
- Fargues, P. (2011). International Migration and the Demographic Transition: A Two-Way Interaction. *International Migration Review*, 45(3). 2
- Hildebrandt, N. and McKenzie, D. (2005). The Effects of Migration on Child Health in Mexico. *Economía*, 6(1):257–289. 4
- Lindstrom, D. P. and Saucedo, S. G. (2002). The Short- and Long-Term Effects of U.S. Migration Experience on Mexican Women’s Fertility\*. *Social Forces*, 80(4):1341–1368. 2
- Massey, D. S., Rugh, J. S., and Pren, K. A. (2010). The Geography of Undocumented Mexican Migration. 8
- Miles, T. J. and Cox, A. B. (2014). Does Immigration Enforcement Reduce Crime? Evidence from Secure Communities. *The Journal of Law and Economics*, 57(4):937–973. 5
- Nobles, J. (2011). Parenting from Abroad: Migration, Nonresident Father Involvement, and Children’s Education in Mexico. *Journal of Marriage and Family*, 73(4). 4
- Osuna Gomez, D. and Medina Cortina, E. M. (2026). The Effect of Immigration Enforcement Abroad on Immigrants’ Home-Country Firms. *Journal of Political Economy Microeconomics*. 3, 4, 5, 8, 10
- Pearson, T. (2026). Immigration Enforcement and Origin Country Labor Markets. *Working paper*. 15
- Ruggles, S., King, M. L., Levison, D., McCaa, R., and Sobek, M. (2003). IPUMS-International. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 36(2):60–65. 9

Schmidheiny, K. and Siegloch, S. (2023). On Event Studies and Distributed-Lags in Two-Way Fixed Effects Models: Identification, Equivalence, and Generalization. *Journal of Applied Econometrics*, 38(5):695–713. 3, 12

Zaragoza-Jiménez, C. A., Barranco-Flores, A., Álvarez-Aceves, M., Palacio-Mejía, L. S., and Hernández-Ávila, J. E. (2025). Digital Transformation of Vital Statistics in Mexico: The Case of the Birth Certificate. *Revista Panamericana de Salud Pública*, 49:e67.  
7

## Figures and tables

### Tables

Table 1: Effect of predicted deportation shock on total fertility rate

	(1)	(2)	(3)	(4)
$\beta$ : SC deportee share	0.224*** [0.0737]	0.172** [0.0725]	0.228*** [0.0746]	0.165** [0.0823]
Observations	18,330	18,330	17,372	18,330
Dep. var. mean	2.373	2.373	2.370	2.373
Municipality FE	✓	✓	✓	✓
Year FE	✓	✓	✓	
State $\times$ Year FE				✓
Mun-year trends		✓		
Baseline $\times$ Year			✓	
N clusters	2,329	2,329	2,209	2,329

*Note:* The dependent variable is the municipal total fertility rate (TFR). The treatment variable is the predicted deportation shock ( $\psi_{m,t}$ ), expressed in percentage points. Column (1) includes municipality and year fixed effects. Column (2) adds municipality-specific linear time trends. Column (3) adds baseline characteristics from the 2000 Census interacted with year dummies: education shares (less than primary, primary, secondary), urban share, log population, and initial TFR (2005). Column (4) replaces year FE with state $\times$ year fixed effects. Standard errors are clustered at the municipality level and reported in brackets. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Table 2: Effect of predicted deportation shock on age-specific fertility rates

	ASFR 15-19	ASFR 20-24	ASFR 25-29	ASFR 30-34	ASFR 35-39	ASFR 40-44
$\beta$ : SC deportee share	0.00393 [0.0041]	0.0216*** [0.0066]	0.0145** [0.0060]	-0.00249 [0.0055]	0.00393 [0.0037]	0.00108 [0.0020]
Observations	18,177	18,294	18,282	18,175	17,832	15,917
Dep. var. mean	0.0732	0.1332	0.1214	0.0876	0.0482	0.0163
Municipality FE	✓	✓	✓	✓	✓	✓
Year FE						
State $\times$ Year FE	✓	✓	✓	✓	✓	✓
Mun-year trends						
Baseline $\times$ Year						
N clusters	2,329	2,329	2,329	2,329	2,327	2,262

*Note:* Each column reports a separate regression where the dependent variable is the age-specific fertility rate (ASFR) for the indicated age group. The treatment variable is the predicted deportation shock ( $\psi_{m,t}$ ), expressed in percentage points. All regressions include municipality and state $\times$ year fixed effects. Standard errors are clustered at the municipality level and reported in brackets. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Table 3: Effect of predicted deportation shock on birth rates by mother's characteristics

<i>Panel A: By marital status</i>				
	Overall	Single	Married	In union
$\beta$ : SC deportee share	1.154*** [0.2951]	0.108 [0.1575]	0.142 [0.2116]	0.724** [0.3138]
Observations	18,330	18,330	18,330	18,330
Dep. var. mean	8.1929	0.8555	3.0572	6.8382
Municipality FE	✓	✓	✓	✓
Year FE				
State $\times$ Year FE	✓	✓	✓	✓
Mun-year trends				
Baseline $\times$ Year				
N clusters	2,329	2,329	2,329	2,329
<i>Panel B: By education</i>				
	Primary or less	Secondary	Tertiary	
$\beta$ : SC deportee share	0.107 [0.1959]	0.647** [0.2516]	0.0191 [0.0473]	
Observations	18,330	18,330	18,330	
Dep. var. mean	2.8588	4.2756	0.5239	
Municipality FE	✓	✓	✓	
Year FE				
State $\times$ Year FE	✓	✓	✓	
Mun-year trends				
Baseline $\times$ Year				
N clusters	2,329	2,329	2,329	

*Note:* Each column reports a separate regression where the dependent variable is the birth rate per 100 women aged 15–49 in the municipality. The numerator counts births to mothers in the indicated subgroup; the denominator is the total female population aged 15–49, common across all columns. Panel A decomposes births by the mother's marital status at the time of birth registration: single, formally married, or in union (married or cohabiting in *unión libre*). Panel B decomposes births by the mother's education level: primary or less ( $\leq 6$  years), secondary (7–12 years), or tertiary (13+ years). The treatment variable is the predicted deportation shock ( $\psi_{m,t}$ ), expressed in percentage points. All regressions include municipality and state $\times$ year fixed effects. Standard errors are clustered at the municipality level and reported in brackets. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Table 4: Effect of predicted deportation shock on fertility by birth order

	First births	Higher-order	First births (union)	Higher-order (union)
$\beta$ : SC deportee share	0.284 [0.2202]	0.870*** [0.2468]	-0.0174 [0.1739]	0.741*** [0.2391]
Observations	18,330	18,330	18,330	18,330
Dep. var. mean	3.4924	4.7005	2.5797	4.2586
Municipality FE	✓	✓	✓	✓
Year FE				
State $\times$ Year FE	✓	✓	✓	✓
Mun-year trends				
Baseline $\times$ Year				
N clusters	2,329	2,329	2,329	2,329

*Note:* Each column reports a separate regression where the dependent variable is the birth rate per 100 women aged 15–49. Columns (1) and (2) use all births; Columns (3) and (4) restrict to births where the mother is married or cohabiting (*unión libre*). First births are those in which the child is the mother’s first live birth (parity = 1); higher-order births are those of parity two or above. Birth order is recorded in the INEGI vital statistics microdata. The treatment variable is the predicted deportation shock ( $\psi_{m,t}$ ), expressed in percentage points. All regressions include municipality and state $\times$ year fixed effects. Standard errors are clustered at the municipality level and reported in brackets. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

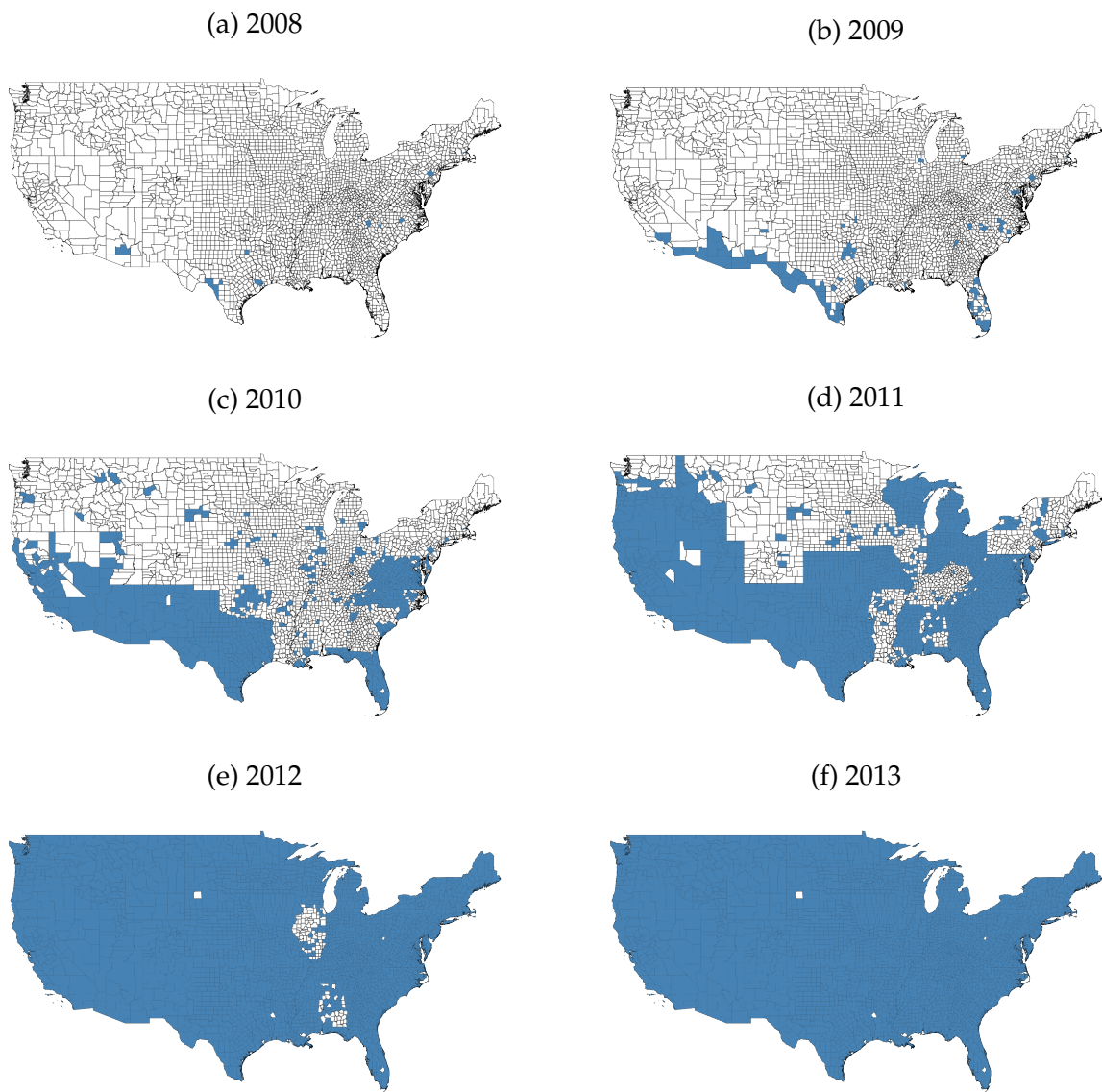
Table 5: Effect of predicted deportation shock on labor market outcomes

<i>Panel A: Women</i>		
	Emp. rate	Log earnings
$\beta$ : SC deportee share	0.856** [0.3345]	-0.0226 [0.0354]
Observations	2,202	2,199
Dep. var. mean	-1.8037	7.2195
State FE	✓	✓
Controls	✓	✓
<i>Panel B: Men</i>		
	Emp. rate	Log earnings
$\beta$ : SC deportee share	0.366 [0.4749]	0.0908 [0.0554]
Observations	2,202	2,202
Dep. var. mean	-4.8130	2.7647
State FE	✓	✓
Controls	✓	✓

*Note:* Each column reports a long-difference regression of the 2010–2015 change in the indicated outcome on the cumulative predicted deportation shock ( $\psi_m$ ). Panel A reports outcomes for women aged 18–44; Panel B reports outcomes for men aged 18–54. The sample excludes individuals enrolled in school. The employment rate is the employment-to-population ratio, expressed in percentage points. Log earnings are trimmed at the 1st and 99th percentiles within each year. All regressions include state fixed effects and baseline controls (log working-age population, gender ratio, education shares, age composition, return migrant share, log area, and population growth). Standard errors are clustered at the state level and reported in parentheses. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

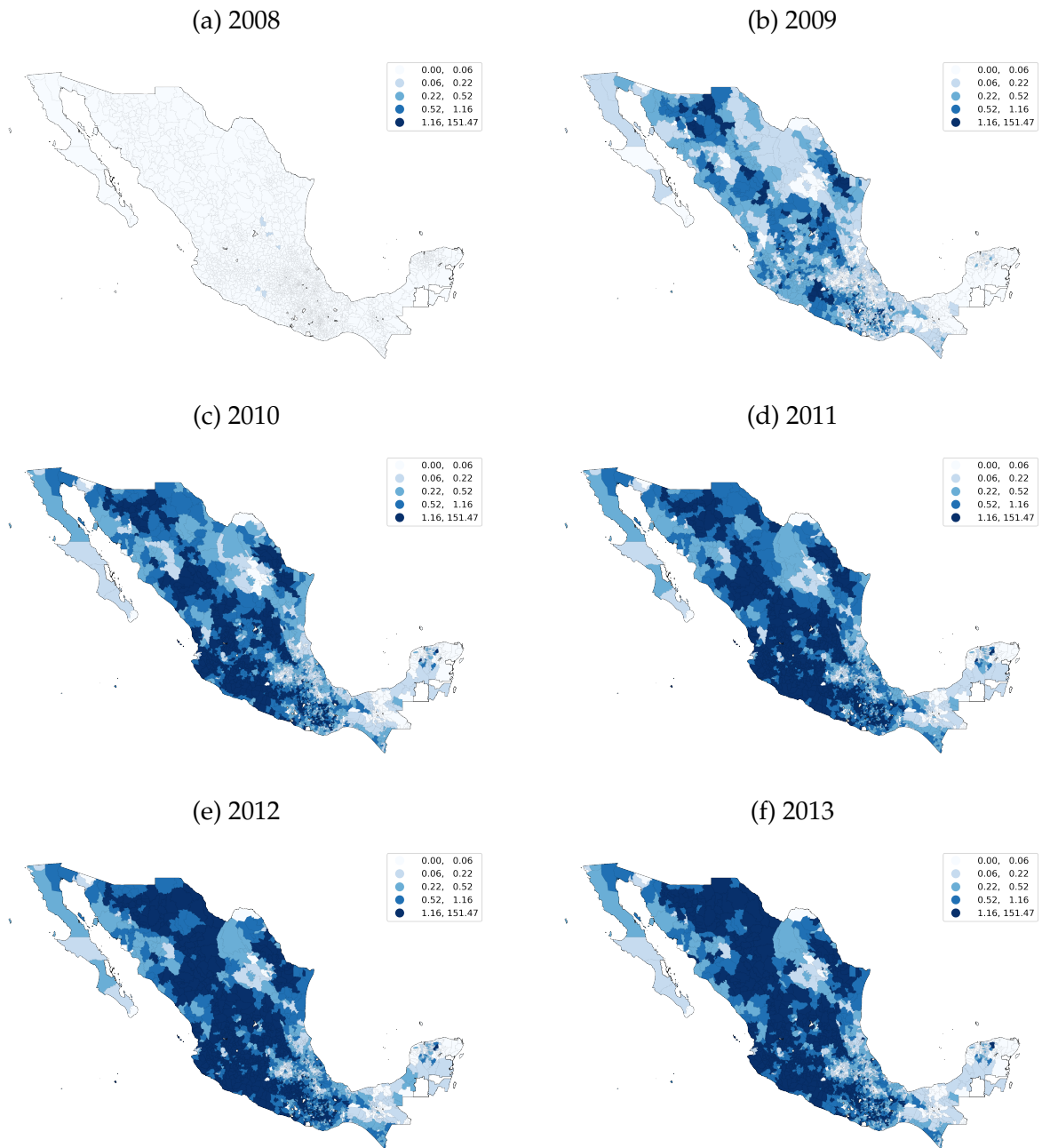
## Figures

Figure 1: Secure Communities activation across U.S. counties, 2008–2013



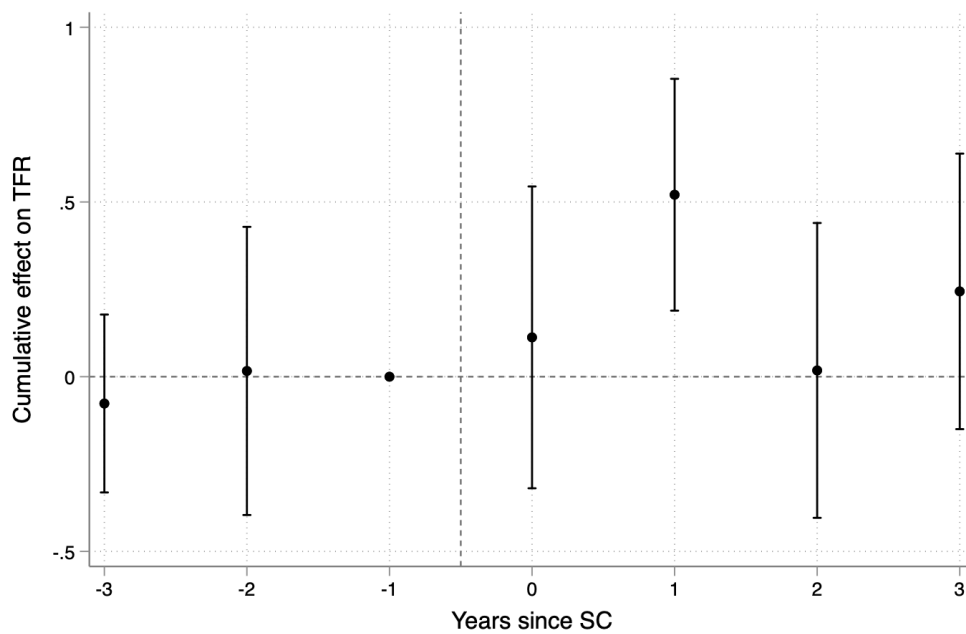
*Note:* Each panel shows the cumulative set of U.S. counties that had activated the Secure Communities program by the end of that year. Shaded counties are active; white counties are not yet active.

Figure 2: Predicted deportation shock across Mexican municipalities, 2008–2013



*Note:* Each panel shows the spatial distribution of the predicted deportation shock ( $\psi_{m,t}$ ) per 1,000 inhabitants across Mexican municipalities for that year. Darker shading indicates higher exposure. Quantile bins are held constant across years for comparability.

Figure 3: Event study: cumulative effect of deportation shock on TFR



*Note:* The figure plots cumulative treatment effects ( $\Gamma_k$ ) from a distributed-lag model of the TFR on the predicted deportation shock ( $\psi_{m,t}$ ), following ?. The specification includes municipality and state $\times$ year fixed effects, with standard errors clustered at the municipality level. The model includes two leads and three lags;  $k = -1$  is the normalization period ( $\Gamma_{-1} = 0$  by construction). Whiskers show 95% confidence intervals.

# Online Appendix

## A Supplementary Figures and Tables

Table A1: Summary statistics

	Mean	SD	P25	Median	P75	N
<i>Panel A: Fertility outcomes</i>						
Total fertility rate	2.43	0.68	2.03	2.36	2.74	25,393
ASFR 20-24	0.14	0.04	0.11	0.13	0.16	25,354
ASFR 25-29	0.13	0.04	0.10	0.12	0.14	25,333
Birth rate (per 100 women 15-49)	8.34	2.31	6.90	8.09	9.48	25,393
First-birth rate (per 100 women 15-49)	3.46	1.22	2.78	3.26	3.87	25,393
Higher-order birth rate (per 100 women 15-49)	4.88	1.88	3.75	4.70	5.78	25,393
<i>Panel B: Treatment variable (post-SC years)</i>						
SC deportee share (pp)	0.07	0.10	0.01	0.03	0.10	18,330
<i>Panel C: Municipality characteristics (baseline)</i>						
Female population 15-49	11,983.09	37,414.60	1,015.00	2,967.00	7,751.00	2,354
Share less than primary education (2000)	0.42	0.13	0.33	0.43	0.51	2,229
Share primary education (2000)	0.43	0.10	0.37	0.44	0.51	2,229
Share secondary education (2000)	0.06	0.05	0.02	0.05	0.09	2,229
Urban share (2000)	0.38	0.35	0.00	0.35	0.70	2,224
Return migrant share (2000)	0.01	0.01	0.00	0.00	0.01	2,223
Gender ratio M/F (2000)	0.92	0.10	0.85	0.92	0.98	2,223
Population density (2000)	177.34	604.79	18.97	48.64	116.47	2,224

*Note:* Panel A reports fertility outcomes for the municipality×year panel (2005–2015). The total fertility rate (TFR) equals  $5 \times \sum \text{ASFR}_a$  for ages 15–44. Birth rates are expressed per 100 women aged 15–49. Panel B reports the predicted SC deportation shock ( $\psi_{m,t}$ ) in percentage points for post-SC years (2008–2015). Panel C reports municipality characteristics measured at baseline (2000 Census for education, urban share, return migrant share, and gender ratio; 2005 for female population).

Table A2: Effect of predicted deportation shock on return migration from the U.S.

<i>Panel A: Men</i>					
	All	Primary–	Secondary+	Age 18-29	Age 30-44
$\beta$ : SC deportee share	0.750*** [0.1531]	0.803*** [0.1830]	0.523*** [0.0752]	0.440*** [0.1157]	1.045*** [0.2558]
Observations	2,202	2,202	2,199	2,202	2,201
Dep. var. mean	1.6586	1.7994	1.1716	1.1806	2.3603
State FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
<i>Panel B: Women</i>					
	All	Primary–	Secondary+	Age 18-29	Age 30-44
$\beta$ : SC deportee share	0.332*** [0.0541]	0.328*** [0.0593]	0.324*** [0.0876]	0.310*** [0.0727]	0.477*** [0.0933]
Observations	2,202	2,202	2,198	2,201	2,202
Dep. var. mean	0.5345	0.5311	0.5360	0.4519	0.7121
State FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓

*Note:* Each column reports a cross-sectional regression of the municipal share of return migrants (in percentage points) on the cumulative predicted deportation shock ( $\psi_m$ ). The dependent variable is the share of working-age adults (18–54) in 2015 who reported living in the United States five years earlier (2010), as recorded in the 2015 Intercensal Survey. Panel A restricts the numerator and denominator to men; Panel B to women. Columns decompose by education level (primary or less vs. secondary or above) and age group (18–29 vs. 30–44). All regressions include state fixed effects and baseline controls (log working-age population, gender ratio, education shares, age composition, log area, and population growth). Standard errors are clustered at the state level and reported in brackets. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .

Table A3: Effect of predicted deportation shock on union formation

<i>Panel A: Women</i>				
	Union rate	Marriage rate	Cohab. rate	Sex ratio
$\beta$ : SC deportee share	0.245 [0.2547]	0.389 [0.3260]	-0.144 [0.1657]	-0.0338 [0.2823]
Observations	2,202	2,202	2,202	2,202
Dep. var. mean	0.3384	-3.6317	3.9701	2.1084
State FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
<i>Panel B: Men</i>				
	Union rate	Marriage rate	Cohab. rate	
$\beta$ : SC deportee share	0.115 [0.1728]	0.300 [0.2313]	-0.185 [0.1808]	
Observations	2,202	2,202	2,202	
Dep. var. mean	-0.0417	-3.6472	3.6055	
State FE	✓	✓	✓	
Controls	✓	✓	✓	

*Note:* Each column reports a long-difference regression of the 2010–2015 change in the indicated outcome on the cumulative predicted deportation shock ( $\psi_m$ ). Panel A reports outcomes for women aged 18–44; Panel B reports outcomes for men aged 18–54. The sample excludes individuals enrolled in school. Union rate includes both formal marriage and cohabitation (*unión libre*). Sex ratio is defined as males 18–54 per female 18–44. All regressions include state fixed effects and baseline controls (log working-age population, gender ratio, education shares, age composition, return migrant share, log area, and population growth). Standard errors are clustered at the state level and reported in parentheses. Significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.10$ .