# Supplemental Appendix

# The Birth of Mass Unauthorized Immigration in the United States

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## I. Historical Background

The Mexican government long discouraged emigration to the U.S., fearing that population loss would endanger its economic development. However, the state changed its position and policies in the 1970s due to a combination of poor local economic conditions and high population growth (Minian, 2018). Mexican inflows to the U.S. skyrocketed. Of the 2.74 million foreign-born Mexicans residing in the U.S. in 1980, more than half – 1.59 million – had arrived in the 1970s, and the pace of arrival accelerated as the decade wore on.

The legal environment in which Mexicans entered the U.S. in the 1970s was very different than it had been through the mid-1960s. Due to a combination of pressure from southwestern agricultural interests and foreign diplomacy (Yang, 2020), immigration from Mexico – and indeed the entirety of the Western Hemisphere – was not quota-restricted under the 1924 Immigration Act, unlike inflows from Europe and the rest of the world. Mexican arrivals were, however, not always welcomed or lawful after 1924: due to concerns over competition with native workers, Mexicans were repatriated in large numbers during the Great Depression, and from 1953 to 1954, "Operation Wetback" deported an estimated one million Mexicans, some with U.S. citizenship. Still, starting during World War II, Mexican men routinely came to the U.S. both temporarily and lawfully as agricultural contract labor ("Braceros"), establishing a pattern of circular migration for men from rural areas in central Mexico (Minian, 2018).

The situation changed starkly in the mid-1960s. Motivated again by concerns over domestic employment, President Johnson ended the Bracero program in 1964.[1] In 1965, the INA

[1] Existing evidence suggests that these concerns were misplaced: neither the Bracero exclusion (Clemens, Lewis, and Postel, 2018) nor Mexican repatriations during the Great Depression (Lee, Peri, and Yasenov, 2022) increased the employment of U.S. born workers.

then established the first-ever quota (of 120,000 entrants annually) on immigration from the Western Hemisphere. The law also abolished the national-origins quota system imposed on the Eastern Hemisphere in 1924, replacing it with a higher worldwide limit on lawful immigration, a preference system favoring family reunification and skill, and 20,000-person annual country-specific limits. The preference system and the 20,000 annual limits were extended to Mexico and the rest of the Western Hemisphere in the 1976 amendments to the INA. The 1976 amendments also ended the labor certification exemption for parents of U.S. born children that had long applied to the Western Hemisphere (Legomsky and Gravo, 1976).

The combination of increasing Mexican inflows and more restrictions on lawful pathways to entry meant that most of the new Mexican arrivals by the late 1970s did not have authorization. Indeed, taking the gap between total and lawful arrivals as an estimate of unauthorized flows, the counts plotted in Figure 1 suggest that 61% of 1975-79 Mexican arrivals residing in the U.S. in 1980 were unauthorized,[2] compared to 45% for 1970-74 arrivals, 30% for 1965-69 arrivals, and 10% for 1960-64 arrivals. Overall, 37% of foreign-born Mexican U.S. residents in 1980 were in the country unlawfully.

[2] The "other lawful residents" figure for 1975-79 Mexican arrivals may exceed expectations based on a 20,000 annual quota on Mexico since some categories of non-citizen lawful entrants are not quota restricted. For example, naturalized citizens can sponsor certain categories of migrants (like spouses and parents) in unlimited numbers.

## II. Treatment Definition

### *A. Unauthorized Share of Foreign-Born Mexican Mothers*

Our treatment variable is $u^{MEXF}_{c(s),1979}$ – the unauthorized share among foreign-born Mexican women residing in U.S. county *c* in state *s* and giving birth in 1979.[3] We estimate this as:

$$u^{MEXF}_{c(s),1979} = \sum_y \omega^{MEXF,y}_{c,1979} u^{MEXF,y}_{c(s),1979}, \quad \text{(A1)}$$

where $u^{MEXF,y}_{c(s),1979}$ is the 1979 unauthorized share among foreign-born Mexican women born in year *y* and residing in county *c* in state *s*. We restrict *y* to be between 1935 and 1965 (inclusive), which keeps only women between the ages of 15 and 45 in our sample.[4] Construction of this variable is described in Appendix Section II.B.

$\omega^{MEXF,y}_{c,1979}$ is then the share of U.S. born children in 1979 who have foreign-born Mexican mothers, in county *c* and birth cohort *y*, relative to the total number of such children in county *c* across the 1935 to 1965 maternal birth cohorts of foreign-born Mexicans.[5] That is, $\omega^{MEXF,y}_{c,1979} = N^{MEXF,y}_{c,1979} / \sum_{y\in[35,65]} N^{MEXF,y}_{c,1979}$, where $N^{MEXF,y}_{c,1979}$ is the count of children born in 1979 to foreign-born Mexican women (themselves born in year *y*) residing in county *c*. Counts of U.S. born children come from Natality Detail Data, which contain individual birth records for either the universe or a 50% random sample of births, depending on state and year.[6] Equation (A1) thus estimates the unauthorized rate across all foreign-born Mexican women giving birth in 1979 in county *c* by taking a weighted average of county- and cohort-specific unauthorized rates.

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[3] For expository ease, we include the "s" subscript in this appendix only on terms where state-level data are relevant in their estimation.

[4] These ages represent, respectively, the 1st and 99th percentiles of maternal age for foreign-born Mexican women giving birth in the U.S. in 1979.

[5] Thus, by construction, $\sum_y \omega^{MEXF,y}_{c,1979} = 1$ for all *c*.

[6] All states in our sample have 50% samples in 1970. In 1979, IL and TX data are the universe of births, but data for the remaining three states (AZ, CA, NM) remain 50% random samples.

*B. Estimating County- and Cohort-Specific Unauthorized Rates*

The 1979 unauthorized share of foreign-born Mexican women born in year *y* residing in county *c* in state *s*, $u_{c(s),1979}^{MEXF,y}$, is defined as a residual, i.e., as one minus the authorized share for this group. We estimate the authorized share for this group as the sum of two quantities: (i) the share of this group who are naturalized citizens ($nat_{c(s),1979}^{MEXF,y}$); and (ii) the share of this group who are otherwise lawful residents ($olr_{c(s),1979}^{MEXF,y}$):

$$u_{c(s),1979}^{MEXF,y} \approx 1 - \left( nat_{c(s),1979}^{MEXF,y} + olr_{c(s),1979}^{MEXF,y} \right). \quad \text{(A2)}$$

Other Lawful Residents

The lawful resident share of this group is given by

$$olr_{c(s),1979}^{MEXF,y} \equiv \frac{OLR_{c,1979}^{MEXF,y}}{POP_{c(s),1979}^{MEXF,y}}, \quad \text{(A3)}$$

where $OLR_{c,1979}^{MEXF,y}$ is the number of female Mexican Green Card and temporary visa holders (and $olr_{c(s),1979}^{MEXF,y}$ is the rate) born in year *y* and residing in county *c* in 1979, and $POP_{c(s),1979}^{MEXF,y}$ is the number of foreign-born Mexican females in the same cohort and county, also in 1979. We obtain $OLR_{c,1979}^{MEXF,y}$ using the *Alien Address Reports 1980 Public Use File* (U.S. Department of Justice, 1992), which record the sex, country of origin, year of birth, and zip code of residence (which we code to counties) for all foreign-born migrants lawfully resident in the U.S. in early 1980.[7]

We obtain $POP_{c(s),1979}^{MEXF,y}$ via approximation from the Census taken April 1, 1980:[8]

[7] While the data release is technically for 1980, very few lawful residents report entering in 1980 relative to 1979 or earlier: among Mexican women born 1935 to 1965, only 0.27% entered the U.S. in 1980, compared to 3.52% in 1979. In this subsample of interest, 97.3% were lawful permanent residents or held Green Cards.

[8] Note that the timing of the 1980 Census is comparable to that of *Alien Address Reports 1980 Public Use Data*. Throughout, we adjust for a projected 25% Census undercount of Mexicans in the 1980 Census (Borjas, Freeman, and Lang, 1991).

(A4) $$POP^{MEXF,y}_{c(s),1979} \approx POP^{HISPF,y}_{c,1980}\left(\frac{POP^{MEX,y}_{s,1980}}{POP^{HISP,y}_{s,1980}}\right)\left(\frac{\frac{POP^{MEX}_{c,1980}}{POP^{HISP}_{c,1980}}}{\frac{POP^{MEX}_{s,1980}}{POP^{HISP}_{s,1980}}}\right),$$

where $POP^{HISPF,y}_{c,1980}$ is the number of Hispanic women in county *c* born in year *y* in 1980, from Census tabulations distributed by NHGIS (Manson, et al., 2024). The second term represents the Mexican share among Hispanics in state *s* in birth cohort *y*, which we estimate from the 5% public-use microdata sample (PUMS) of the 1980 Census (Ruggles et al., 2025). This term thus scales down Hispanic female population in the county and cohort by the Mexican share among Hispanics in that cohort in the state as a whole. To account for the fact that some counties have higher foreign-born Mexican population shares than others, the final term then scales by the share of foreign-born Mexicans among Hispanics at the county level relative to the state level, using county-level figures reported by NHGIS (Manson, et al., 2024).[9]

Naturalized Citizens

Lastly, the naturalized share of this group is defined as:

(A5) $$nat^{MEXF,y}_{c(s),1979} \equiv \frac{NAT^{MEXF,y}_{c(s),1979}}{POP^{MEXF,y}_{c(s),1979}}$$

where $NAT^{MEXF,y}_{c(s),1979}$ is the number of female Mexican naturalized citizens born in year *y* and residing in county *c*. Unlike $OLR^{MEXF,y}_{c(s),1979}$, $NAT^{MEXF,y}_{c(s),1979}$ is not observable in administrative data. In this case, we estimate the rate directly rather than separately estimating its components:

(A6) $$nat^{MEXF,y}_{c(s),1979} \approx nat^{MEXF,y}_{s,1980}\left(\frac{\frac{NAT^{HISP,y}_{c,1980}}{POP^{HISP,y}_{c,1980}}}{\frac{NAT^{HISP,y}_{s,1980}}{POP^{HISP,y}_{s,1980}}}\right).$$

[9] Census tabulations are based on larger samples than the PUMS, so are preferable to use where available.

The first term is the naturalized share among foreign-born Mexican women born in year *y* residing in early 1980 in state *s*, which we estimate from the 5% 1980 Census PUMS (Ruggles, et al., 2025). The second term accounts for the fact that naturalization rates vary across counties; because we cannot observe county-level naturalization rates for Mexicans (even overall), we scale by the Hispanic naturalization rate at the county relative to the state level, using county-level naturalized citizen and population counts reported by NHGIS (Manson, et al., 2024).

## III. Sample Definition

We first restrict our sample to the top 100 U.S. counties ranked by the number of births to foreign-born Mexican mothers in 1970. Out of the total 45,060 such births, these counties account for 92.4%. From this group, we drop Los Angeles County because it is an extreme outlier: in 1970, it alone had 15,212 births to foreign-born Mexican mothers (33.8% of such births in the top-100 sample),[10] and an estimated unauthorized rate nearly twice the average as in our ultimate estimation sample.

We then drop states with fewer than four counties in the sample. This yields 81 counties across five states: California, Texas, Arizona, New Mexico, and Illinois. Together, these represent 85.1% of births to foreign-born Mexican mothers in 1970 (excluding LA County). Finally, we drop two counties for which we cannot compute $u_{c(s),1979}^{MEXF,y}$ for *all* maternal birth cohorts.[11] This reduces the final sample to 79 counties across 5 states,[12] which account for 84.4% of births to foreign-born Mexican mothers in 1970 (excluding LA).

[10] The next largest county (Harris County, IL) accounted for only about 6%.

[11] The two dropped counties are both in New Mexico. De Baca county reports that $POP_{c,1980}^{HISPF,y} = 0$ for three maternal birth cohorts ($y$), and Los Alamos county reports that $POP_{c,1980}^{MEX} = 0$, which affects the construction of the estimated unauthorized rate across all maternal birth cohorts $y$ (equation (A4)).

[12] They are, in **Arizona** (6): Cochise, Maricopa, Pima, Pinal, Santa Cruz, Yuma; **California** (32): Alameda, Colusa, Contra Costa, Fresno, Imperial, Kern, Kings, Madera, Merced, Monterey, Orange, Placer, Riverside, Sacramento, San Benito, San Bernardino, San Diego, San Francisco, San Joaquin, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, Santa Cruz, Solano, Sonoma, Stanislaus, Sutter, Tulare, Ventura, Yolo, Yuba; **Illinois** (6): Cook, Du Page, Kane, Lake, Rock Island, Will; **New Mexico** (5): Bernalillo, Chaves, Dona Ana, Hidalgo, Mora; **Texas** (30): Bell, Bexar, Brazoria, Cameron, Culberson, Dallas, Deaf Smith, Dimmit, Ector, El Paso, Fort Bend, Galveston, Guadalupe, Harris, Hidalgo, Lubbock, Maverick, Nueces, Pecos, Presidio, Reeves, Starr, Tarrant, Tom Green, Travis, Uvalde, Val Verde, Webb, Willacy, Zavala.

## IV. References


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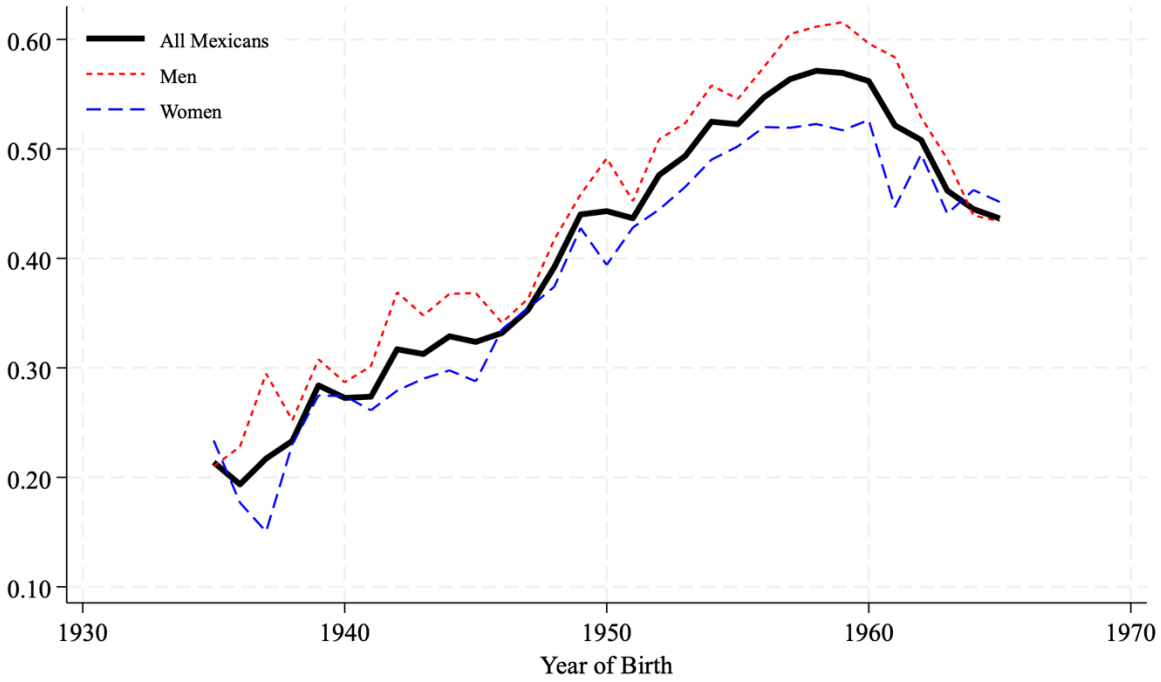
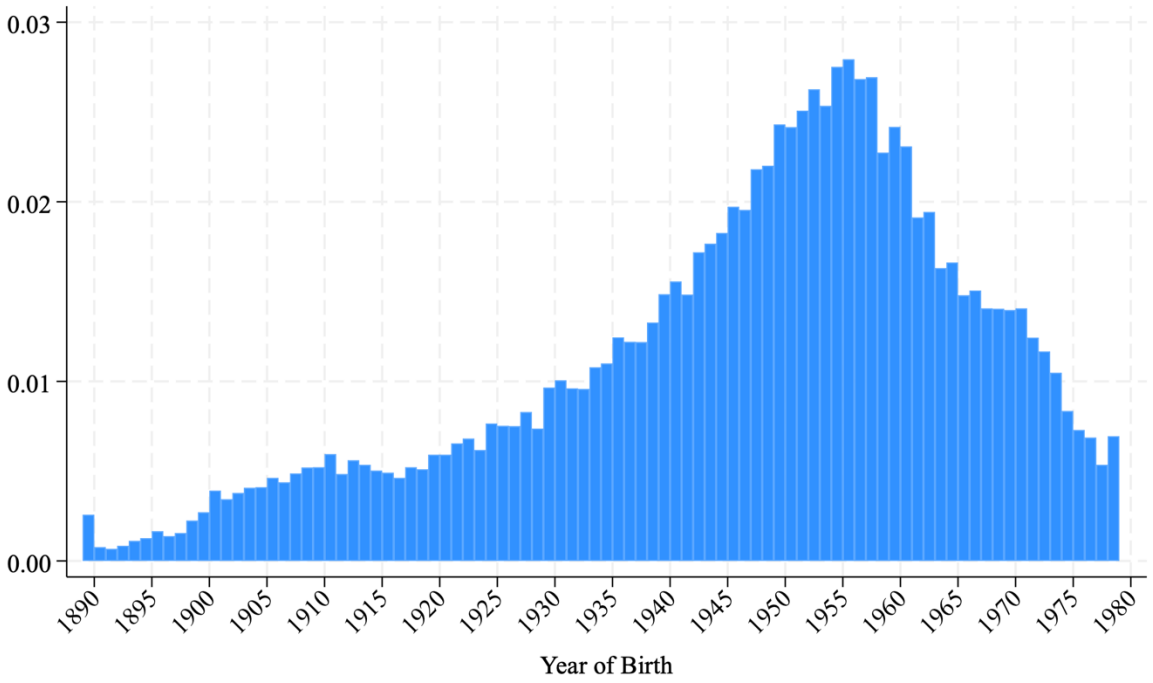
# V. Tables and Figures




APPENDIX FIGURE 1. 1980 MEXICAN UNAUTHORIZED SHARE BY GENDER AND YEAR OF BIRTH

*Note:* Unauthorized shares calculated as the gap in the share of total and lawful arrivals of Mexican migrants in 1980, by gender and year of birth. Total arrivals and naturalized citizens are calculated from 1980 Census 5% public use microdata (Ruggles et al., 2025). Other lawful residents (Green Card and temporary visa holders) are drawn from the *Alien Address Reports 1980 Public Use* File (U.S. Dept. of Justice, 1992). Total arrivals are the sum of naturalized citizens and other lawful residents. Details on calculation of these figures are given in the Supplemental Appendix.




APPENDIX FIGURE 2. BIRTH YEAR FOR 1980 U.S. RESIDENT WOMEN BORN IN MEXICO

*Note:* Histogram of the 1980 share of foreign-born Mexican women residing in the U.S., by year of birth. Sample restricted to those with non-U.S. born parents. Calculated from the 1980 Census 5% public-use microdata (Ruggles et al., 2025).

APPENDIX TABLE 1 – SUMMARY STATISTICS BY CHILD'S YEAR OF BIRTH AND MOTHER'S ETHNICITY

| | 1979 | | 1970 | |
|---|---|---|---|---|
| Mother's ethnicity: | *MEXF* | *NATIVEF* | *MEXF* | *NATIVEF* |
| Birth weight | 3,389 | 3,327 | 3,357 | 3,275 |
| | [45.4] | [62.1] | [55.3] | [48.9] |
| Ln of birth weight | 8.13 | 8.11 | 8.12 | 8.09 |
| | [0.01] | [0.02] | [0.02] | [0.02] |
| Low birth weight share | 0.05 | 0.07 | 0.06 | 0.08 |
| | [0.01] | [0.02] | [0.02] | [0.01] |
| High birth weight share | 0.11 | 0.10 | 0.10 | 0.08 |
| | [0.02] | [0.02] | [0.03] | [0.01] |
| Mother's age | 25.63 | 24.76 | 26.81 | 24.35 |
| | [0.62] | [0.62] | [0.65] | [0.56] |
| Male share | 0.51 | 0.51 | 0.52 | 0.51 |
| | [0.02] | [0.01] | [0.04] | [0.01] |
| Second child share | 0.26 | 0.32 | 0.21 | 0.28 |
| | [0.03] | [0.01] | [0.03] | [0.02] |
| Third child share | 0.17 | 0.15 | 0.20 | 0.20 |
| | [0.02] | [0.01] | [0.03] | [0.01] |
| Fourth or more child share | 0.24 | 0.10 | 0.36 | 0.17 |
| | [0.05] | [0.03] | [0.06] | [0.04] |
| Number of births | 2,481 | 25,266 | 1,258 | 29,742 |
| | [2,178] | [24,597] | [986] | [33,245] |
| Observations | 79 | 79 | 79 | 79 |

*Note:* Means are reported with standard deviations in brackets and are sourced from Natality Detail Data, which contain individual birth records for either the universe or a 50% random sample of births, depending on state and year. Data are aggregated to group-by-county of maternal residence-by-child birth year averages, and statistics are weighted by the group-specific county share of 1970 births in the sample. Birth outcomes include average birth weight (in grams) and natural log of birth weight and shares low birth weight (<2500 grams) or high birth weight (>4000 grams). Birth characteristics include maternal average age at childbirth and the share of children who were male at birth. Parity variables indicate the shares of children who were second, third, or fourth (or higher) birth order.

APPENDIX TABLE 2 – CORRELATES OF 1980 UNAUTHORIZED RATES

| | Unauthorized Rate (x100) |
|---|---|
| Hispanic share (1970) | -0.645 |
| | (0.239) |
| Unemployed share (1970) | -1.011 |
| | (1.615) |
| Population per square mile (1970) | -0.000236 |
| | (0.000963) |
| Urban population share (1970) | 0.0190 |
| | (0.125) |
| Population percentage change (1960-1970) | 0.153 |
| | (0.120) |
| Population percentage, 18 or older (1970) | 0.126 |
| | (1.291) |
| Population percentage, 25 or older with high school (1970) | -0.385 |
| | (0.466) |
| Services employment share (1970) | 0.558 |
| | (1.563) |
| Construction employment share (1970) | -1.603 |
| | (2.103) |
| Families with income < $3000 share (1970) | 0.341 |
| | (0.652) |
| Constant | 50.90 |
| | (74.21) |
| Observations | 79 |
| R-squared | 0.750 |
| State fixed effects | Yes |
| F: 1970 county chars. | 3.588 |
| p: 1970 county chars. | 0.000594 |

*Note:* Table reports the coefficients from a regression of the estimated 1980 unauthorized share (multiplied by 100) on 1970 county characteristics and state fixed effects. Robust standard errors are in parentheses. Regression is weighted by the number of births to foreign-born Mexican women in 1970. Characteristics are sourced from the County and City Data Book (United States Bureau of the Census, 2012).

APPENDIX TABLE 3 – DIFFERENCE-IN-DIFFERENCES AND TRIPLE-DIFFERENCE ESTIMATES OF THE EFFECT OF MATERNAL UNAUTHORIZED STATUS ON PREDICTED BIRTH WEIGHT (IN GRAMS)

| | DD: 1979 | DD: 1970 | DDD: 1979 - 1970 | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Coefficient | 2.6 | -13.4 | 16.0 | 17.3 |
| | (7.9) | (9.0) | (6.6) | (7.9) |
| Observations | 158 | 158 | 316 | 316 |
| R-squared | 0.983 | 0.989 | 0.987 | 0.997 |
| County fixed effects | Y | Y | Y | Y |
| State x *MEXF* fixed effects | Y | Y | Y | Y |
| State x *MEXF* x 1979 fixed effects | N | N | Y | Y |
| County x 1979 fixed effects | N | N | Y | Y |
| County x *MEXF* fixed effects | N | N | N | Y |
| 1970 county chars x *MEXF* x 1979 | N | N | N | Y |
| p: 1970 county chars x *MEXF* x 1979 | | | | 0.373 |

*Note:* Outcome is predicted birth weight (in grams), where the prediction is based on the group-specific 1970 relationship between birth weight and a cubic in maternal age, indicators for second, third, and fourth or higher parity, and an indicator for child sex. Columns (1) and (2) present least squares estimates of $\theta^{DD}$ from model (2) using Natality Detail Data from 1979 and 1970, respectively. Underlying data are aggregated to the county of maternal residence-by-child birth year-by-group level. Column (3) presents the difference between the column (1) and column (2) estimates, and column (4) regression adjusts that difference for county-by-group fixed effects and year- by group-specific effects of the 1970 county characteristics listed in Appendix Table 2. *MEXF*=1 for children born to Mexican women, and *MEXF*=0 for children born to native women. Regression estimates are weighted by the group-specific county share of 1970 births in the sample, and standard errors (in parentheses) are clustered on county. Sample consists of births to Mexican and U.S. born mothers residing in one of 79 counties across five states: California, Texas, Illinois, Arizona, and New Mexico. DD=difference-in-differences coefficient, DDD=triple differences coefficient.