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OPENING THE DOOR:  
IMMIGRANT LEGALIZATION AND FAMILY REUNIFICATION IN THE UNITED STATES

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**ABSTRACT**

Does opening the door to U.S. citizenship for unauthorized immigrants cause out-of-control “chain migration”? We address this question using variation from the legalization programs of the Immigration Reform and Control Act of 1986 (IRCA). Exploiting IRCA’s introduction and differences across metropolitan areas in program intensity, we estimate that each IRCA-legalized Mexican was responsible for the subsequent immigration and legal admission of one relative – in total – through 2019. Most sponsored relatives were immediate family, and the adult sponsorship rate is inconsistent with out-of-control chain migration. Estimates using cross-country variation are substantively similar and suggest limited demand for reunification of extended families.

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*Most green cards in the United States are awarded based on an antiquated system of family ties, not skill or merit. This system of Chain Migration – whereby one immigrant can bring in their entire extended families, who can bring in their families and so on – de-skills the labor force, puts downward pressure on wages, and increases the deficit.*

- White House Communication  
December 15, 2017<sup>1</sup>

*Under the current broken system, a single immigrant can bring in virtually unlimited numbers of distant relatives.*

- Donald Trump, State of the Union, 2018

## **I. Introduction**

A hallmark of the U.S. immigration system since the Immigration and Nationality Act of 1965 has been prioritization of family reunification over other considerations. In 2019, more than two-thirds of the 1.03 million immigrants “admitted” to the U.S. – the same as becoming a “lawful permanent resident” (LPR) or obtaining a “Green Card” – did so through a family tie, or through “sponsorship” by an existing LPR or U.S. citizen (U.S. Department of Homeland Security, 2020). Such “chain migration” is thought to be a pervasive drag on the economy, and the threat of it continues to block legalization of any of the estimated 10.5 million unauthorized immigrants currently in the U.S. (Passel and Cohn, 2018).<sup>2</sup> However, claims that the U.S. system generates “explosive” or “out-of-control” chain migration are common even among proponents of a more open immigration system.<sup>3</sup>

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<sup>1</sup> [https://trumpwhitehouse.archives.gov/articles/time-end-chain-migration/?utm\\_source=twitter&utm\\_medium=social&utm\\_campaign=wh\\_20171218\\_Chain-migration\\_v2](https://trumpwhitehouse.archives.gov/articles/time-end-chain-migration/?utm_source=twitter&utm_medium=social&utm_campaign=wh_20171218_Chain-migration_v2) (accessed 11/26/2021)

<sup>2</sup> Qui, Linda. “What Is ‘Chain Migration’? Here’s the Controversy Behind It.” *New York Times* January 26, 2018, accessed at <https://www.nytimes.com/2018/01/26/us/politics/the-facts-behind-the-weaponized-phrase-chain-migration.html> November 18, 2021.

<sup>3</sup> For example, Jasso and Rosenzweig (1986) quotes from the 1981 Immigration Reform Commission, “Once any person enters the country under any preference...It is possible that no less than 84 persons would become eligible for visas in a relatively short period of time” due to waves of family sponsorship. Orrenius and Zavodny (2010)’s immigration reform proposal strongly advocates for legalization but also warns of the “explosive chain migration” occurring in the wake of legalizations of the Immigration Reform and Control Act of 1986 (p. 93).

Despite this, there are in fact no credible estimates of the “sponsorship rate” – the number of relatives an admitted foreigner induces to come to the U.S. by directly sponsoring them.<sup>4</sup> Lacking data on who sponsors whom, most past studies (Yu, 2008; Carr and Tienda, 2013; Tienda, 2018) consist of accounting exercises that make heroic assumptions about who can start a migratory “chain” and the amount of time that can transpire between the initial admission of a foreigner to the U.S. and subsequent family sponsorship. These assumptions can greatly affect the estimates.<sup>5</sup> Even if this weren’t the case, accounting exercises ignore the possibility that sponsored relatives might have otherwise come to the U.S. through other channels – including without authorization – propelled by the same “push” and “pull” factors that led their sponsor to immigrate. In other words, it can look like family preference in migrant admissions generates additional migration, when it would have happened anyway.

The ideal way to identify the sponsorship rate would be to randomly vary the number of new foreigners admitted, generating variation in the stock of potential sponsors unrelated to the broader push and pull factors underlying immigration. Any subsequent increase in family-sponsored admissions could then be traced back to the increased number of potential sponsors, not these other factors. We argue that the legalization programs of the Immigration Reform and Control Act of 1986 (IRCA) provide just such a natural experiment. As shown in Figure 1, IRCA’s legalization programs generated 2.7 million admissions over the narrow time frame from 1989 and 1991. Countries across the world contributed to this admissions spike, but nearly three-

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<sup>4</sup> Much of the recent literature seems to have used the term “immigration multiplier” (e.g., Yu, 2008; Carr and Tienda, 2013) for what we are calling the “sponsorship rate.” We find compelling Jasso and Rosenzweig’s (1989) argument that the term “multiplier” is ambiguous and confusing, because it could either mean the single generation sponsorship rate,  $r$ , or the long-run multiplier, represented by the geometric sum  $r + r^2 + r^3 + \dots$ .

<sup>5</sup> For example, Tienda (2018) estimates that every Mexican admission in the late 1990s subsequently sponsored 6.38 family members. However, the paper’s estimation procedure assumes that all family admissions from Mexico in the early 2000s were sponsored by a small number of employer-sponsored Mexican admissions in the late 1990s, ignoring the much larger IRCA cohort admitted a decade before.

quarters of it came from Mexico. Importantly, relative to the stock of existing potential sponsors, the number of IRCA admissions varied across countries – and for Mexico, across metro areas – in ways that appear as good as random, unrelated to other factors affecting immigration trends.

Our main analysis exploits IRCA’s introduction and differences across metro areas in the size of the IRCA admissions spike for Mexicans. Using newly compiled administrative data on immigrant admissions, we find that through 2019 – fully 30 years after the initial legalization event – the average Mexican awarded a Green Card through IRCA was responsible for just over one additional admission *in total*. Immediate relatives, namely spouses and unmarried children of a sponsor, account for 84% of this effect. The remainder owes to parents (13%) and siblings and married children (3%). Taken together, these findings suggest that the average Mexican admitted through IRCA sponsored far fewer than one new adult, the sponsored relatives who are critical to starting migratory chains (Jasso and Rosenzweig, 1986, p. 308).<sup>6</sup>

These estimates are robust. By incorporating time-varying effects of the stock of pre-existing Mexican LPRs and citizens, our approach removes biases from push factors, such as the Mexican Peso crisis, which may have induced earlier cohorts of potential sponsors to sponsor relatives at higher rates. Our estimates are also not sensitive to controls for local pull factors, like demand shocks for Mexican labor or traditional predictors of future Mexican settlement (e.g., the Bartik “ethnic enclave” instrument). Further, though some of our confidence intervals are wide, we find no evidence that relatives sponsored by the IRCA-legalized cohort would have come to the U.S. through other channels, authorized (e.g., as employer-sponsored LPRs) or unauthorized. This additional finding supports a causal interpretation of our estimates, as well as shows that IRCA was not a “magnet” for subsequent unauthorized immigration.

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<sup>6</sup> Children cannot be sponsors and are likely to sponsor few relatives even as adults: their parents and siblings are generally already admitted, and their children will be U.S. born.

The conclusions are broadly similar when we use variation across origin countries in the size of the legalization shock, regardless of place of residence within the U.S. These estimates are larger (1.7 family-sponsored admissions per IRCA LPR), and a smaller portion (two-thirds) come from spouses and children. However, for the average country, the number of adult relatives sponsored per IRCA LPR is still economically and statistically inconsistent with explosive chain migration. The estimates are also lower for the subset of countries that, like Mexico, have low naturalization rates, which are more representative of the typical IRCA LPR. Naturalization affords broader sponsorship rights, particularly greater potential to sponsor the adult relatives like siblings and parents who can perpetuate migratory chains. This result is consistent with a causal interpretation of our findings and suggests that demand for reunification of extended families, at least as revealed by naturalization, may be more limited than oft portrayed.

What do these estimates imply about the family sponsorship rate and the potential for chain migration to be “out-of-control”? By incorporating data through 2019 into our analysis, we may be estimating not just the first-generation sponsorship rate,  $r$ , but also second-generation effects, and so on (e.g.,  $r + r^2 + r^3 + \dots$ ). Our estimates could therefore be consistent with  $r < 1$ , or with migratory chains dying out. On the other hand, first generation impacts may have not yet been realized. Supply-side factors matter for some types of adult relatives: Annual quotas on citizen-sponsored admissions of siblings and married children generate long wait lists for entry, and estimated effects for these relatives remain significant (though small) in 2019. Yet, on the demand side, low citizen sponsorship of quota-unrestricted adult relatives (parents) and low naturalization rates suggest that  $r < 1$ , even if first-generation impacts are not observed in full.

This is the first paper to rigorously examine how opening the door to U.S. citizenship for the unauthorized reverberates through the American immigration system. Our estimates suggest

that in practice, the current system results in migration by nuclear families, with few of the legalized bringing distant relatives. This appears due to not just legal limits on the supply of slots, but also low demand for family sponsorship, insofar as that demand is reflected in naturalization rates. The generalizability of our estimates to present-day policy thus depends on the comparability of the naturalization rates of any newly admitted population with those of the IRCA LPR cohort and the supply of slots relative to cohort size. Naturalization rates have not risen (Teke, 2019), and quotas have also not changed since 1990. However, there is a much larger unauthorized population today. Our estimates are therefore likely an upper bound on longer-term effects if a similar program were instituted in the current policy environment.

## II. Background and Data

This paper focuses on what the Department of Homeland Security (DHS) calls *immigrant admissions* – foreign nationals admitted to the U.S. as LPRs, or with Green Cards. Immigrant admissions are one of two major forms of authorized immigration to the U.S., and not all immigrant arrivals are authorized.<sup>7</sup> We return to other forms of immigration later, focusing here on the rules governing immigrant admissions since 1965 and on our sources of data on immigrant admissions.<sup>8</sup> (See Online Appendix A for more details.)

### A. Admissions Programs

The primary way for a foreigner to be admitted to the U.S. (as an LPR/with a Green Card) is to be sponsored. Since 1965, three major groups have been eligible to sponsor admissions – American citizens, current Green Card holders/LPRs, and employers. The first two

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<sup>7</sup> What the DHS calls “non-immigrant admissions” are foreign nationals permitted to enter the U.S. on a temporary basis, such as with student or employment visas. Because this language may be confusing, in the remainder of the paper we refer to non-immigrant admissions as “other authorized arrivals.” “Unauthorized arrivals” then consist of those who overstayed a temporary visa or entered the U.S. without a visa.

<sup>8</sup> Data on other authorized and unauthorized arrivals are described in Section IV.C.

groups can sponsor family members only. However, there are differences in which family members they can sponsor: Both citizens and current LPRs can sponsor their spouses and minor (under age 21) or unmarried children for admission, but only citizens can sponsor their parents, married children, and siblings – adult relatives who might continue the migratory “chain.”<sup>9</sup>

Though citizens can sponsor their spouses, minor children, and parents for admission in unlimited numbers, other family sponsorship is quota restricted. LPRs can sponsor children and spouses, but only up to an annual (worldwide) quota of 114,200.<sup>10</sup> Since the Immigration Act of 1990, citizen-sponsored admissions of adult or married children and of siblings have also been subject to worldwide caps 46,800 and 65,000, respectively. For the most part, naturalized citizens of all countries compete equally for these slots, but countries face an additional 7% cap on how much of any category-specific quota they may use annually (e.g., naturalized citizens from any given country can sponsor no more than 4,550 siblings per year). This cap tends to bind for large sending countries, like Mexico. It also applies separately to the quota on LPR sponsorship of spouses and children.

There are other pathways to admission that do not rely on sponsorship. Refugees can become LPRs, as can winners of the diversity visa lottery, which was established in 1990. Special, limited-time programs have also been periodically established by law. The historically most significant of these and our programs of study were authorized by IRCA in 1986.<sup>11</sup> IRCA’s General Legalization Program (GLP) targeted the long-term unauthorized – those who at the

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<sup>9</sup> Spouses can also continue a migratory chain by sponsoring parents and siblings. We return to this issue in Section VI.

<sup>10</sup> In theory, a larger annual admission is possible under the law if few close relatives of citizens are admitted in a year, but this does not happen. The Immigration Act of 1990 also temporarily expanded this quota by 55,000 in each of the fiscal years 1992, 1993, and 1994 expressly for the spouses and children of those legalized under IRCA.

<sup>11</sup> The Nicaraguan Adjustment and Central American Relief Act (NACARA), passed in 1997, did something on a much smaller scale for registered asylum seekers from Nicaragua, Cuba, El Salvador, Guatemala, and the former Soviet Union.

time of application could demonstrate continuous residency in the U.S. since prior to 1982. The Seasonal Agricultural Worker (SAW) program, by contrast, targeted unauthorized arrivals who could demonstrate 90 days of employment in seasonal agriculture (for certain USDA-defined crops) in the year running up to May 1, 1986 and required no more in the way of residency.<sup>12</sup> Admission under these programs – which was concentrated between 1989 and 1991 (Figures 1 and 2) – was the culmination of a multi-step process that began with an application for temporary legal status (Cascio and Lewis, 2019).<sup>13</sup>

Regardless of how Green Cards are awarded, LPRs are eligible to naturalize five years after admission, e.g., starting in 1994 for the earliest awardees under IRCA’s legalization programs, as shown Figure 2. Naturalization rates vary across countries, and in the context of IRCA, they also varied across programs even within country. SAW program participants naturalized at lower rates: As of 2009, 34% of those admitted under the SAW program had naturalized (about 28% for Mexico), compared to 53% of those admitted through the GLP (about 46% for Mexico).<sup>14</sup> A lower naturalization rate means less scope for sponsoring family members.

#### *B. Data on Admissions*

Our main outcome variables are drawn from administrative immigrant admissions data, published as anonymized Immigration and Naturalization Service (INS) microdata (fiscal years

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<sup>12</sup> IRCA also authorized adjustment to permanent residence under two much smaller programs with less restrictive timing: Cubans and Haitians already living in the U.S., and those who had been in the U.S. since at least 1972. These groups are also included in our analysis and in Figure 1.

<sup>13</sup> Temporary legal status afforded certain rights like work authorization and freedom of movement and did not require US exit. To obtain a Green Card under the GLP required a separate application after learning English and passing a civics test. Green Cards were awarded almost automatically to successful SAW applicants 18 months after temporary legal status. Among those who received temporary legal status, nearly all were eventually awarded a Green Card (Cascio and Lewis, 2019).

<sup>14</sup> Baker (2010) separately reports that the overall naturalization rate of IRCA LPRs is 41%, which is lower than what is implied by the rates by program. (Specifically, he says 1.1 million out of 2.7 million naturalized.) This suggests there is some rounding error in these figures. In Figure 2, we display the overall naturalization rate implied by the rates by program (45%) rather than the 41% reported by Baker (2010).

1983 through 2004) and in DHS tables (more recent years).<sup>15</sup> The DHS tables allow us to produce annual counts of Mexican admissions for all key admission categories (e.g., Green Card-sponsored, citizen-sponsored) from 2007 to 2019 for the top 200 receiving counties in each year.<sup>16</sup> We create comparable figures for earlier years from the INS microdata, which include admission category, country of birth, age, as well as zip code of intended residence, which we map to counties. We then aggregate county-level counts for each category to the metro area level, using 1999 Primary Metropolitan Statistical Area boundaries. Our estimation sample is limited by the published tabulations but ultimately consists of 66 metro areas over the period 1983-2019, representing 61% of Mexican LPRs admitted through IRCA.<sup>17</sup>

We obtain IRCA admissions information from the Legalization Applications Processing System (LAPS), anonymized data on all IRCA legalization applicants through the GLP and the SAW program. The LAPS tracks application status through the 1992 fiscal year, at which point 98.2% of GLP and essentially all SAW program applicants who would become LPRs (through 2001) had received Green Cards (Rytina, 2002). The LAPS includes country of origin and county of U.S. residence at the time of application, which we aggregate to metro areas. These data allow us to estimate total Mexican IRCA admissions (through 1992) by metro area.

As discussed below, the key threat to identification in our approach is that Mexicans who had become LPRs or citizens before IRCA changed their likelihood of sponsoring relatives after

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<sup>15</sup> References vary by year and are detailed in Online Appendix A and Table A1. Microdata are available before 1983 but lack enough geographic information to identify metro areas. No data by metro area are available for 2005 and 2006. We linearly interpolate data in those years. The INS microdata also include information on the two much smaller one-time legalization programs authorized by IRCA and described in the earlier note.

<sup>16</sup> One limitation of these tables is that spouses, minor children (under age 21), and unmarried children are grouped together for Green Card sponsored admissions. However, for citizen-sponsored admissions, unmarried children are reported separately. Below, the category labelled “spouses and kids” includes unmarried adult children, but only if sponsored by Green Card holders, and the category labelled “other relatives” includes unmarried adult children, but only if sponsored by citizens. Where separately reported, sponsorship of unmarried adult children is very low.

<sup>17</sup> To ensure accurate measurement of the legalization ratio, described in the next section, we also required that the area have at least 20 registered Mexican Green Card holders in 1980. This eliminated one metro area: Trenton, NJ.

IRCA. It is therefore important to measure and control for time-varying effects of existing Mexican LPRs and citizens in our analysis. We obtain information on the number of existing Mexican LPRs by metro area using an anonymized 1980 registry of Green Card holders (“Alien Address Reports”), compiled and distributed by the INS (U.S. Department of Justice, 1992). Like the anonymized INS microdata, this registry gives country of origin and zip code of U.S. residence, which we code to metro areas. A similar registry is not available for foreign-born citizens, so we estimate the number of Mexican citizens by metro area using the 5% public use microdata sample of the 1980 Census of Population (Ruggles, et al, 2020).

### **III. Identification Strategy**

#### *A. Intuition*

The sharp timing of IRCA comprises the first element of our identification strategy: increases in family-sponsored admissions due to IRCA should become apparent only after the IRCA cohort transitioned to sponsorship status. For example, because parent and sibling visas require citizen sponsorship, and the IRCA cohort did not naturalize until starting in 1994 (Figure 2), admissions of parents and siblings due to IRCA should appear only in 1994 or later. However, spouses and minor or unmarried children can be sponsored by LPRs, and so could have seen their numbers rise soon after 1989 (Figure 2). We conservatively assume that increases in family sponsorship due to IRCA may have appeared as early as 1989.

To demonstrate, Figure 3 Panel A shows admissions under IRCA and other categories for Mexico, which accounted for roughly 75% of IRCA LPRs; Panel B scales these counts by the number of cumulative (though 1992) Mexican IRCA LPRs.<sup>18</sup> Green Card-sponsored admissions rose after 1991, and citizen-sponsored admissions rose starting in the mid-1990s. Likewise, only

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<sup>18</sup> Country-level admissions data were obtained from the sources described in Section II.B and Online Appendix A.

after the mid-1990s did admissions of parents and other non-immediate relatives start to rise, though admissions of spouses and kids rose after 1991 (Panel C). To arrive at a preliminary estimate of the number of family-sponsored admissions induced by each Mexican IRCA LPR, we first take pre-post differences in the scaled variables around 1988 (based on our conservative assumption). We then multiply this difference by 31 (years) to accumulate the predicted change in annual admissions per IRCA LPR through 2019. At 1.07 (s.e.=0.12), this estimate implies that, for each IRCA LPR, there has been about one Mexican family-sponsored admission *in total* between 1989 and 2019.<sup>19</sup> 75% of these are spouses and kids (Panel C).

A drawback of relying on timing alone for identification is that *other* potential sponsors could have changed their propensity to sponsor relatives due to aggregate shocks. For example, the Mexican Peso crisis unfolded in the mid-1990s, potentially encouraging *existing* (pre-IRCA) Mexican LPRs and naturalized citizens to sponsor *more* relatives for admission than they had been before. A time series analysis could thus falsely “assign” to IRCA LPRs the admissions of relatives sponsored by an earlier cohort. As noted above, the available data do not identify *who* sponsored any given admission, precluding us from directly removing LPRs sponsored by that earlier cohort from the data. Instead, we exploit variation over time and across U.S. metro areas in the number of IRCA LPRs holding constant the size of the existing legal population. It is thus through regression adjustment that we separate sponsorship among the IRCA LPR cohort from changes in sponsorship among existing legal Mexicans.

#### B. *Specification*

At base, we relate family-sponsored admissions of Mexicans settling in metro area  $c$  in (fiscal) year  $t$  ( $a_{ct}$ ) to time-varying effects of the number of Mexican IRCA LPRs ( $lpr_{c,IRCA}$ ) and

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<sup>19</sup> Massey and Pren (2012) also note the rise in Mexican family-sponsored admissions since 1990, but their interpretation is about absolute scale of admissions rather than rates of sponsorship.

the number of Mexicans in the U.S. legally before IRCA (i.e., LPRs and naturalized citizens measured in 1980;  $legal_{c,1980}$ ), controlling for metro area fixed effects. (See Online Appendix B.) Even with fixed effects, however, estimation of models in levels can be unstable when there are large differences in scale across cross-sectional units, as is the case in this application. The Los Angeles metro area was home to more than 560,000 Mexican IRCA LPRs. The metro area next closest (Orange County) had 108,000 Mexican IRCA LPRs. The size of Mexican IRCA cohorts in most other metro areas was in the thousands. (See Table 1 Panel A and Table A2.)

We therefore estimate a model that rescales the levels model by  $legal_{c,1980}$ :

$$\frac{a_{ct}}{legal_{c,1980}} = \delta_c + \gamma_t + \sum_{\tau \neq 1988} \theta_\tau D_t^\tau \left( \frac{lpr_{c,IRCA}}{legal_{c,1980}} \right) + \varepsilon_{ct}. \quad (1)$$

$\delta_c$  represents a vector of metro area fixed effects, which account for the possibility that some areas have systematically larger Mexican admissions annually than others.  $\gamma_t$  is then a vector of year fixed effects. Since the  $D_t^\tau$  are a set of year dummies (equal to one if  $t = \tau$ ), these could have alternatively been represented as  $\sum_{\tau \neq 1988} \gamma_\tau D_t^\tau$ . As shown in Online Appendix B, the  $\gamma_t$  capture predicted year-to-year changes in the number of new family-sponsored LPRs per *existing* (i.e., pre-IRCA) legal Mexican, due to the Mexican Peso crisis or any other aggregate factor. The year fixed effects in (1) thus help us to avoid confounding admissions due to IRCA with admissions due to an increasing propensity for family sponsorship among pre-IRCA LPRs and citizens in the same way as would allowing for time-varying effects of  $legal_{c,1980}$  in a levels model.

Likewise, the coefficients of interest – on the interactions between year dummies and the “legalization ratio,”  $lpr_{c,IRCA}/legal_{c,1980}$  – capture the time-varying effects of  $lpr_{c,IRCA}$  in a levels model. More specifically, for any given  $\tau$ ,  $\theta_\tau$  gives the predicted difference in admissions between  $\tau$  and the omitted year, 1988, for each Mexican IRCA LPR. Accumulating across years after 1988 (again, using our conservative assumption on effect timing),  $\theta = \sum_{\tau=1989}^{2019} \theta_\tau$ , we then

arrive at an estimate of how many family admissions the average Mexican IRCA LPR was ultimately responsible for, as of 2019.

For least squares estimates of the  $\theta_\tau$  in (1) – and thus of  $\theta$  – to capture the full family- sponsorship effects of IRCA, it must be the case that sponsored family members locate in the same metro area in which their sponsors originally settled. This seems reasonable for immediate family, but only if sponsors have low mobility within the U.S. And even with that, siblings and parents may settle elsewhere. We thus also estimate a version of (1) replacing metro areas with origin countries, ignoring place of settlement within the U.S. Finding that cross-country variation delivers similar estimates would suggest that internal migration is not a great source of bias.

For our estimates to have a causal interpretation, we must also assume that areas with higher legalization ratios would not have had larger increases in family-sponsored admissions in the absence of IRCA’s legalization programs. If the legalization ratio were correlated with the location of traditional Mexican enclaves, for example, the spread of new Mexican arrivals beyond traditional enclaves in the 1990s (Card and Lewis, 2007) – some of whom may have been family-sponsored admissions – could bias our estimates. The remainder of this section examines this assumption empirically; estimates of  $\theta_\tau$  for  $\tau < 1988$  and of  $\theta$  for other immigrant arrivals – both presented in Section IV – also provide tests of the identifying assumption.

### *C. Probing the Identifying Assumption*

Table 1 Panel A lists the metro areas with the top legalization ratios in our estimation sample of 66 metro areas, in descending order by the ratio’s value. (See Table A2 for the full sample and Table A3 for descriptive statistics on all variables.) While Los Angeles was home to the largest *number* of Mexican Green Cards awarded under IRCA – and is a traditional

destination for Mexican immigrants – it did not have anywhere near the highest legalization ratio. Indeed, metro areas in Florida, rather than California, dominate the top-ten list. Florida metro areas had relatively high SAW program shares in their legalized populations, and indeed, variation from the SAW program explains a large share of the variation in the legalization ratio (Table A4). Lower naturalization rates of SAWs (Figure 2) would have reduced their ability to sponsor relatives, an issue to which we return below.

Table 1 Panel B turns to estimation of the cross-sectional relationship between the legalization ratio and several correlates of trends in Mexican settlement at the metro area level. The 1980 Mexican share in the local population, which was a strong predictor of the spread of Mexican arrivals across the U.S. in the 1990s (Card and Lewis, 2007), is significantly lower in metro areas with higher legalization ratios (column 2).<sup>20</sup> However, the coefficient on the legalization ratio is smaller in magnitude and not statistically significant conditioning on state fixed effects (column 3). To remove bias from state-specific shocks, we therefore augment (1) to include state-by-year fixed effects, rather than just year fixed effects.<sup>21</sup>

Conditioning on state fixed effects, the legalization ratio is also not correlated with two measures of local labor demand shocks – local job growth leading up to IRCA (calculated from County Business Patterns data) and a Bartik-style predictor of Mexican job growth through 2019 based on 1980 occupation mix (see Online Appendix A). All these predictors of Mexican settlement are also jointly insignificantly related to the legalization ratio within state.<sup>22</sup> These

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<sup>20</sup> This is not a mechanical negative correlation: The density measure in row a of Panel B includes all Mexicans, not just citizens and LPRs, and was measured using tabulations from the 20% count data (Manson et al., 2020).

<sup>21</sup> State-by-year fixed effects also remove bias from state-by-year heterogeneity in the relationship between existing legal immigrants and family-sponsored admissions. See Online Appendix B.

<sup>22</sup> Online Appendix B shows conditions under which a feasible scaling by legal immigrants as of 1980 (instead of 1988, just before IRCA) will lead to unbiased estimates. A sufficient condition is that the legalization ratio is uncorrelated with admissions over 1981-1987 per existing legal immigrant in 1980. While data are unavailable for 1981 and 1982, Table 1 Panel B shows that conditional on state fixed effects, the legalization ratio does not predict Mexicans admitted between 1983 and 1987. Table A4 shows that the legalization ratio does not significantly predict

results are reassuring, since Mexican settlement patterns are particularly responsive to local economic conditions (Cadena and Kovak, 2016). These findings instill confidence that larger post-IRCA increases in the number of sponsored relatives in metro areas with higher legalization ratios reflect an increase in the number of potential sponsors through IRCA, not other factors.

#### IV. Cross-Metro Area Estimates for Mexican Immigrants

##### A. Baseline Estimates

Figure 4 Panel A presents estimates of the  $\theta_\tau$  from model (1) (expanded to include state-by-year fixed effects), along with 90% confidence intervals, for the two main family sponsorship categories – Green Card and citizen – and for their sum, capturing total family sponsorship.<sup>23</sup> As expected, Green Card-sponsored admissions rose after the spike in IRCA Green Card awards (which culminated in 1991), with the first statistically significant coefficient arising in 1993.<sup>24</sup> Increases in citizen-sponsored admissions emerged later, reflecting the lag in naturalization, and are not significant until 1999. After that, both series fluctuate for about 10 years before trending downward, though citizen-sponsored flows remain statistically significant through the end of the period.

Table 2 summarizes these event-study estimates with estimates of  $\theta$ , which sum the post-1988 coefficients separately for each visa category (i.e.,  $\hat{\theta} = \sum_{\tau=1989}^{2019} \hat{\theta}_\tau$ ), thus estimating cumulative admissions per Mexican IRCA LPR. Intuitively, our approach assigns admissions above and beyond what have been predicted in a given state and year to metro areas based on the increase in potential sponsorship due to IRCA. Our baseline estimates (column 1) imply 0.48

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the rate at which applications for legal status under IRCA were accepted, reducing concerns about endogenous admission rates (e.g., a preference for families) driving our results.

<sup>23</sup> The year-by-year scatterplots underlying the estimates of the  $\theta_\tau$ 's for overall family sponsorship (Figure A1) show that the estimates are not driven by outliers.

<sup>24</sup> The lag in effects is not entirely surprising given that the cross-metro variation is driven by the SAW program, and LPRs under the SAW program received their Green Cards later than those under the GLP (Figure 2).

additional Green Card-sponsored admissions (s.e.=0.09) and 0.55 additional citizen-sponsored admissions (s.e.=0.18) through 2019 for every Mexican IRCA LPR, amounting to 1.03 additional family-sponsored Mexican admissions in total (s.e.=0.25). Weighting by 1980 metro area population lowers the estimates and reduces precision (Solon, Haider, and Wooldridge, 2015), but the basic pattern remains unchanged (column 2).

Table 2 also presents  $\hat{\theta}$ 's by relative type. Spouses and kids account for most of the effect on family-sponsored admissions (column 1 coef. (s.e.)=0.87 (0.20)); parents account for most of the remainder (coef. (s.e.)=0.12 (0.05)). The timing of effects reflects the fact that only citizens can sponsor family members beyond spouses and unmarried children: admissions of parents did not significantly rise until the late-1990s (Figure A2 Panel A). Still, spouses and kids continue to dominate the remaining admissions, stabilizing at around 80% of the total by 2019. Other relatives (siblings, married and adult kids) account for only 3% of IRCA-sponsored family admissions, and this estimate is not statistically significant (column 1 coef. (s.e.) = 0.03 (0.02)). The overall estimate is like what we obtained from the time series analysis for Mexico (Figure 3), but the breakdown across sponsorship categories differs somewhat.<sup>25</sup>

### *B. Robustness*

Our estimates can be interpreted causally if, in the absence of IRCA, trends in family-sponsored admissions would have been the same across metro areas in the same state, but with different legalization ratios. While this is fundamentally unknowable, the timing of effects across admissions categories after IRCA aligns with expectations. The fact that areas with relatively

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<sup>25</sup> The time-series estimates are 1.07 for all family-sponsored admissions, 0.45 for Green-Card sponsored, and 0.62 for citizen-sponsored (vs. 1.03, 0.48, and 0.55, respectively, in Table 2). One key difference is in the number of sponsored parents per IRCA LPR, which is much higher in the time series (0.27) than in the cross-area analysis (0.12). This may mean the dramatic rise in Mexican parental admissions, emphasized in Tienda (2017), may be mostly driven by aggregate forces other than IRCA.

high legalization ratios for their state were not already experiencing an upward trend in family-sponsored admissions prior to IRCA (Figure 4 Panel A) also suggests that the legalization ratio is not correlated with unobserved drivers of family-sponsored admissions. In addition, Table 2 column 3 shows that adding time-varying effects of the vector of predictors of Mexican arrivals (Table 1 Panel B) has virtually no effect on the point estimates but makes them more precise.<sup>26</sup>

However, our identifying variation is driven by the SAW program (Table A4), so our estimates may be lower than what would be representative of Mexican IRCA admissions in general. To explore this possibility, we split the legalization ratio into two – one legalization ratio based on SAW admissions only and other based on the GLP and the small number of other IRCA admissions (both divided by  $legal_{c,1980}$ ). Consistent with low naturalization rates in the SAW program (Figure 2), SAWs induced a smaller increase in citizen-sponsored admissions (Table A5 Panel B, 0.49 vs. 0.84). However, this difference is entirely offset by SAWs' significantly greater Green Card-sponsored admissions (0.57 vs. 0.01); families intact at the time of IRCA would have been jointly eligible for legalization under the GLP's long-term residency requirements. We fail to reject that SAWs sponsored the same number of relatives as others legalized by IRCA; in fact, the overall SAW point estimate is larger (1.06 vs. 0.85).

In addition, while most of our data are administrative in nature and thus should have little potential for error, the number of Mexican naturalized citizens in 1980 is estimated from the 1980 Census 5% sample, and so may be subject to random (e.g., sampling error) and non-random (e.g., undercounts of Mexicans) mistakes, either of which could bias our estimates. In Online Appendix C we show that realistic values of such mistakes likely bias our slope estimates *upward* – due to a phenomenon like “division bias” (see Borjas, 1980) – but the bias is small.

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<sup>26</sup> Replacing state-by-year fixed effects with year fixed effects (not shown) also has almost no impact on the estimates (the overall estimate is 1.07 (0.22), with 82% accounted for by spouses and kids).

### C. *Other Immigration Flows*

A goal of our identification strategy has been to estimate the number of people who only come to the U.S. because family sponsorship is available to them. For our estimates to represent this, IRCA's legalization programs should not have affected other immigrant admissions categories or other immigrant arrivals. But thus far, we have only estimated regressions in which the  $a_{ct}$  in (1) represented family-sponsored admissions (*family admissions*). We now estimate regressions that replace  $a_{ct}$  with the other components the following identity:

$$total\ arrivals = family\ admissions + other\ admissions + other\ arrivals \quad (2)$$

where *total arrivals* represents total arrivals, *other admissions* is other immigrant admissions (e.g., refugees), and *other arrivals* is other immigrant arrivals (authorized and unauthorized), all from Mexico. If effects on *other admissions* and *other arrivals* are not significant, it would suggest that the marginal Mexican arrival induced by IRCA was a family-sponsored admission.

We first explore impacts on *other admissions* – refugees, diversity visas, and employer-sponsored admissions. As shown in Figure 4 Panel B and Table 2, there are no significant changes in admissions under these categories for more heavily treated metro areas after IRCA versus before. This finding shows that the family admissions generated by IRCA would not otherwise have come on any other type of Green Card, i.e., that these other types of Green Cards do not readily substitute for family-sponsored admissions, at least for Mexicans.

Second, we estimate effects on *other arrivals*. We begin by estimating *total arrivals*, using microdata from the Census and American Community Survey (ACS). To smooth annual fluctuations in these sample data, we aggregate arrival years into bins (mostly in 5-year increments) and adjust equation (1) accordingly, omitting interactions between the legalization

ratio and the indicator for 1987-89 arrival to identify the coefficients of interest.<sup>27</sup> We similarly aggregate  $total\ admissions = family\ admissions + other\ admissions$ . Using the identity in equation (2) as our guide, we then calculate  $other\ arrivals$  as the difference:  $other\ arrivals = total\ arrivals - total\ admissions$ .

Table 3 Panel A gives estimated responses to IRCA legalizations for  $total\ arrivals$  (from the Census/ACS),  $total\ admissions$  (from the administrative data), and their difference,  $other\ arrivals$ ; Figure A4 shows the underlying event-study estimates. Estimates for total admissions in the binned data (column 2; Figure A4 Panel A) are very similar to the response of family-sponsored admissions in Table 2, which is as expected given no significant effects on  $other\ admissions$ . Moreover, by our earlier reasoning, the marginal Mexican immigrant arrival due to IRCA does indeed appear to have been a family-sponsored admission: the  $\hat{\theta}$  for  $total\ arrivals$  (column 1) is slightly larger than that for  $total\ admissions$ , but the coefficient on the difference ( $other\ arrivals$ ) is not statistically significant (column 3).

Effects on  $other\ arrivals$  are of independent interest in this context, insofar as they speak to the impacts of IRCA's legalization programs on subsequent unauthorized arrivals. While studies have concluded that IRCA did not induce a surge in unauthorized immigration (White, Bean, and Espenshade, 1990; Woodrow and Passel, 1990; Bean et al., 1990; Donato, Durand, and Massey, 1992; Orrenius and Zavodny, 2003), this past literature investigated the time series only, looking at outcomes including border apprehensions in the immediate aftermath of IRCA. Our event-study estimates (Figure A4 Panel B) suggest that the noisy zero for  $other\ arrivals$  over the long run (Table 3 Panel A column 3) masks offsetting statistically significant *increases*

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<sup>27</sup> We also stop this analysis in 2018, given concerns about the proper measurement of total arrivals in 2019 using pandemic-era surveys, but adjust this and other bins to be five-year equivalents. We also take advantage of the repeated observations of immigrant arrival cohorts to adjust the data for the fact that arrival cohort sizes may shrink over time due to return migration. Further description is given in Online Appendix A.

in *other arrivals* in the early 2000s (possibly sponsored family members arriving ahead of officially receiving their Green Cards) and *reductions* in *other arrivals* over the past decade. Event study estimates for “likely unauthorized” arrivals, constructed using the method described in Borjas and Cassidy (2019), yield similar conclusions (Figure A4 Panel B).<sup>28</sup>

In summary, though noisy owing to working with sample data, these estimates suggest that metro areas more heavily treated by IRCA were not a stronger magnet for immigrant arrivals more generally over the study period. They are thus consistent with recent evidence that a legalization in Spain was not a magnet for further unauthorized flows (Elias, Monras and Vásquez-Grenno, 2022). Further, Mexicans sponsored for admission by IRCA LPRs would not have come to the U.S. through other admissions programs. The marginal Mexican arrival induced by the IRCA legalizations was a family-sponsored admission.

## V. Cross-Country Estimates

The estimates presented thus far are specific to Mexico and do not capture family-sponsored admissions who do not settle in the same metro area where their sponsor originally resided. We have also presented limited evidence on mechanisms. Why have Mexicans in the IRCA cohort sponsored so few parents, siblings, and married children? The quotas described in Section II have likely played a role, but is this entirely a supply-side story? Could demand for family reunification also be important?

Estimates using variation in the timing of IRCA and cross-country variation in the legalization ratio, in the spirit of the cross-metro area approach, can provide some insight. The

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<sup>28</sup> See Online Appendix A. The Borjas and Cassidy (2019) approach classifies as “likely unauthorized” noncitizens lacking characteristics associated with being authorized. We also examined as an alternative proxy for Mexican unauthorized arrivals – the number of new ID cards issued by Mexican Consulates, so called “Matrícula Consular” cards, using the series in Sanchez et al. (2022), generously provided to us by Maria Caballero Sanchez and Brian Kovak. However, these data have no pre-IRCA values, and it is not clear they capture unauthorized flows since any Mexican arrival is eligible to obtain such a card. Nevertheless, filling in pre-IRCA values with our arrivals-admissions figures, this series also showed no increased association with the Mexican legalization ratio after IRCA.

analysis to follow is based on the 29 countries where IRCA accounted for at least a third of all admissions across the IRCA, refugee, and diversity visa categories combined over our study time frame, 1983 to 2019 (Figure A3), and which have a legalization ratio of at least 0.1 (that is, IRCA increased the number of legal residents from a country by at least 10%).<sup>29</sup> Despite these restrictions, the 29 countries in our final sample cover over 90% of those admitted under IRCA. The variation across countries is nevertheless much lower than the cross-metro area variation for Mexico (Table A3, Panel 1), so precision is correspondingly lower in this approach.

#### A. *Baseline Estimates*

Figure 5 Panel A presents estimates of the  $\theta_\tau$  (90% confidence intervals) from an alternative version of equation (1) where  $c$  indexes country of origin.<sup>30</sup> Like in Figure 4, estimates are unweighted. Similar to that figure, family-sponsored admissions do not rise until after the spike in IRCA Green Card awards (which culminated in 1991), and citizen-sponsored admissions do not emerge until later (and are not statistically significant until 1997). The maximum increase in Green Card-sponsored flows relative to 1988 emerges in 1993, with coefficients trending downward thereafter. But just as in the cross-metro area analysis for Mexico, citizen-sponsored flows remain significant through the end of the period.

Table 4 summarizes with estimates of  $\theta = \sum_{\tau=1989}^{2019} \theta_\tau$  for each sponsorship category for the average country. Including all countries and no additional controls beyond fixed effects

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<sup>29</sup> The first restriction is important because both diversity and refugee visas can generate large spikes in new Green Card holders (Figure A3) – other potential sponsors who could confound our ability to attribute the post-IRCA increase in family-sponsored admissions to IRCA. In practice, most of the countries below the one-third threshold also do not meet the latter 0.1 legalization ratio threshold. For comparison, only one metro area had a legalization ratio below 0.1 (Detroit), which we dropped for consistency. Like in the metro analysis, we also required that the country have at least 20 Green Card holders in 1980. This eliminated only one country (Dominica).

<sup>30</sup> We include world region-by-year fixed effects in this model and cluster standard errors on origin country. Because there are so few counties in our sample outside of the Americas, we consider three groups – North America, South America, and the rest of the world. We allow the year fixed effects to vary by world region because the legalization ratios are particularly high for many Central American and Caribbean countries (Table A7 Panel A).

(column 1), the  $\hat{\theta}$ 's are larger than those presented in Table 2 based on cross-metro area variation for Mexico only. They imply 0.74 additional Green Card-sponsored admissions (s.e.=0.14) and 1.00 additional citizen-sponsored admissions (s.e.=0.41) for every IRCA LPR, amounting to 1.74 additional family-sponsored admissions in total (s.e.=0.43). There are also larger estimates for all relative types, including parents and other relatives besides spouses and kids (see also Figure A2 Panel B). However, the estimates for parents (coef. (s.e.)=0.28 (0.07)) and siblings and married children (coef. (s.e.)=0.23 (0.10)) – even added together (coef. (s.e.) =0.51 (0.17), not shown in table) – remain statistically below one.<sup>31</sup>

We have subjected these estimates to a similar battery of robustness checks as the main cross-metro area analysis. For example, controlling for two time-varying predictors of immigrant arrivals suggested by previous research (Yang, 2006; Lull 2018) – push factors including the real exchange rate and growth in the origin country population – has little impact on the estimates (Table 4 columns 2 and 3).<sup>32</sup> In addition, *other admissions* generally show no significant change (Figure 5 Panel B),<sup>33</sup> and neither *other arrivals* (*total arrivals* – *total admissions*) nor likely unauthorized immigration (Borjas and Cassidy, 2019) significantly rise after IRCA for countries with higher legalization ratios (Table 3 Panel B; Figure A5).

#### B. *Heterogeneity by Supply- and Demand-Side Factors*

The estimates in the first column of Table 4 are not statistically larger than those in Table 2, but they are larger in magnitude. Why? Downward bias from internal migration is one

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<sup>31</sup> Adding spouses could bring the number of adult sponsored relatives above one, but, as we will discuss in Section VI, spouses are likely to be beyond the first generation of sponsorship.

<sup>32</sup> This finding is consistent with the balance test in Table A6 Panel B: Within world region, the legalization ratio is not correlated with trends in the real exchange rate or population growth rates.

<sup>33</sup> One exception is that the employer-sponsored admissions are significantly negatively associated with IRCA legalizations in some subsamples (columns 2 and 3 of Table 4). This suggests that absent IRCA, some IRCA-induced family-sponsored migrants would have come on an employer-sponsored visa – a result that we did not find for Mexico. This finding implies some measure of substitutability between family-sponsored admissions and admissions selected on skill.

potential explanation. An alternative explanation is that our first set of estimates was for Mexico only, and there could be heterogeneous effects across countries. Unfortunately, we cannot pursue analyses using cross-metro area variation for countries besides Mexico due to limitations in the DHS data tables on admissions. However, we can re-estimate the country version of (1) for subsets of countries by a proxy for demand for family reunification, and by the degree to which family reunification is constrained by the supply of slots available, or the quotas.

Naturalization rates may reveal demand since U.S. citizenship expands sponsorship rights. Limiting the sample to the 14 countries with naturalization rates below the median in this sample (60%) produces estimates much closer to those for Mexico alone, with the largest decline coming as expected from citizen-sponsored categories (column 4).<sup>34</sup> The average IRCA LPR came from a low naturalization country, so these estimates are closer to the effect for the average IRCA LPR than the estimates in columns 1 to 3, which give each country equal weight.<sup>35</sup> Moreover, dropping Mexico from this subsample, the estimates for parents (coef. (s.e.) = 0.20 (0.07)) and other relatives (coef. (s.e.) = 0.14 (0.09)) are only slightly larger than found in the cross-metro area analysis for Mexico. This finding suggests that demand-side factors could be an important mechanism for our findings.

We have less scope to explore supply-side factors empirically, since there is so little cross-country variation in the quotas. Mexico is subject to the most restrictive quotas due to its size (i.e., due to the 7% cap; see Section II), and removing it from the subsample of low

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<sup>34</sup> Naturalization rates for IRCA LPRs are not available by country. We thus estimate them using the 5% public-use microdata sample from the 2000 Census, restricting attention to foreign-born arrivals between 1971 and 1986 – cohorts likely legal by 2000 and thus eligible to naturalize. The estimated naturalization rate for Mexico (36%) is similar to the (non-IRCA) naturalization rate for Mexicans in administrative data (35%, from Rytina, 2001). Across countries, estimated naturalization rates are correlated with administratively measured naturalization rates reported occasionally in INS publications. For example, naturalization rates for the 1977 admission cohort (by 1992), have a similar cross-country ranking, with Guyana near the top and Mexico at the bottom (U.S. INS, 1993; p. page 803).

<sup>35</sup> Including Mexico, 92.6% of the IRCA LPRs from the countries in the analysis sample come from what we have called low-naturalization countries. Removing Mexico, this figure is 57%.

naturalization countries (Table 4 column 5) has little impact on the estimates. However, Mexico also has one of the lowest naturalization rates among the subsample of low naturalization countries (Table A7), so we hesitate to draw strong inferences about how quotas affect the estimates based on this finding. Instead, we view the quantitative similarity of this independent estimate, focused on other countries with demand-side conditions like Mexico's, as bolstering the conclusion that demand-side factors contribute to our estimates.

## VI. Discussion

As earlier described, for chain migration to be explosive, the sponsorship rate,  $r$ , must be above one. If  $r < 1$ , by contrast, then the geometric sequence  $\sum_{n=1}^{\infty} r^n$  converges to the value of  $\frac{r}{1-r}$ , i.e., it is non-explosive, or migratory chains die out. Not only that, but the sponsorship relevant for chain migration is of *adults* (Jasso and Rosenzweig, 1986), since children would rarely sponsor relatives and cannot do as minors. What then do our estimates have to say about chain migration?

While the estimand in this paper for all family-sponsored admissions is statistically indistinguishable from one, it arguably overstates the sponsorship rate of adults, for two reasons. First, the sponsorship rate is *generational* in nature, capturing the average number of relatives that come to the U.S. because of a specific sponsor, over that sponsor's lifetime. By contrast, because it is impossible to link family-sponsored admissions to sponsors, the  $\hat{\theta}$  in this paper estimate  $\sum_{n=1}^N r^n$ , where both  $r$  and  $N$  are unknown. That is, our estimates are *time*-based, rather than generation-based. The longer time horizon over which we calculate  $\hat{\theta}$ , the higher  $N$  might be. Because our time horizon is 30 years – well beyond any previous paper that has attempted such estimates – the  $\hat{\theta}$  in this paper could overstate both overall and group-specific (e.g., adult) sponsorship rates. Second, children arguably comprise a large share of all family-sponsored

admissions; spouses and kids together account for between two-thirds and 80% of the estimated impacts, across the two analyses.

Still, rejecting that  $\theta \geq 1$  for the sum of adult relatives outside of spouses and kids, as we do (strongly) in all specifications in both Table 2 and Table 4, does not necessarily prove that  $r < 1$ . There are two reasons: (a) even after 30 years, the first-generation “link” in the chain ( $N = 1$ ) – where the sequence begins – might not be complete; and (b) spouses may also contribute to migratory chains. Let us say a little more about each.

First, why might it be the case that  $N < 1$  still now? Even though we cannot empirically examine the contribution of quotas to our estimates, they extend the time to sponsorship. This is particularly the case for Mexico: according to the State Department’s *Visa Bulletin*, the siblings and married children of Mexican citizens most recently granted Green Cards (as of 2019) submitted applications in the late 1990s, or only shortly after the IRCA LPR cohort began to naturalize.<sup>36</sup> The long wait owes to low category-specific worldwide quotas in combination with the 7% cap on what Mexico can represent in all worldwide admissions in any category (Section II). An even longer horizon for the analysis than 30 years would allow time to work through this large backlog of admissions, clearing waitlists of first-generation relatives of the IRCA cohort, and raising our estimates of  $\theta$  for other relatives.

While this would seem to make it impossible for us to conclude that  $r < 1$ , wait lists as long as Mexico’s are unlikely to clear in the lifetime of Mexican IRCA LPRs: as of 2019, 75% of this cohort was at least age 52, and half were over age 58.<sup>37</sup> Family members potentially sponsored – if not the Mexican IRCA LPR cohort itself – are at risk of dying off before they

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<sup>36</sup> <https://travel.state.gov/content/travel/en/legal/visa-law0/visa-bulletin/2020/visa-bulletin-for-october-2019.html>, accessed 5/17/2023.

<sup>37</sup> Authors’ calculations from the LAPS. Statistics on the age distribution of non-Mexican IRCA LPRs in the countries of our analysis sample are even more extreme: as of 2019, 75% were at least 56, and half were over 62.

reach the front of the queue. Moreover, estimates for other relatives and parents are significantly below one for countries besides Mexico, where wait lists are not so long and first-generation effects are arguably observed in full (Table 4).

Second, spouses may also perpetuate migratory chains by sponsoring their siblings or parents, but the available data do not make it possible to separate out sponsored spouses from their children. However, additional calculations reveal that, even if we did include spouses in total adult relatives sponsored, the number of sponsored adults per IRCA LPR would still be below one for Mexico, as well as for low naturalization countries more generally.<sup>38</sup> Further, unlike other adult relatives, spouses do not face long wait lists for admission. Indeed, even for Mexico, the State Department's *Visa Bulletin* shows there was no backlog of spouses waiting for admission at the same time as other relatives faced lengthy wait lists. This suggests sponsored spouses are, at this point, beyond the first generation ( $N > 1$ ).

Both sets of observations support the conclusion that  $r < 1$ . The constellation of demand-side evidence presented in this paper is also consistent with  $r < 1$ . For example, even though citizens can sponsor parents *without* quota restriction, the  $\hat{\theta}$  for parents for Mexico, at 0.12 (0.05) (Table 2, column 1), is only marginally significantly greater than the estimate for other relatives; in the cross-country analysis, it is statistically indistinguishable, at 0.22 (0.07) (Table 4, column 1). Even scaling by the estimated number naturalized in the IRCA cohort, rather than the entire cohort legalized, the sponsorship rate of parents is not overwhelming: our estimates imply that

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<sup>38</sup> Using the same regressions as Table 2, we estimate that the typical Mexican IRCA LPR sponsored about 0.4 adult relatives in the combined categories of parents, siblings, adult/married children and citizen-sponsored spouses. This misses Green Card sponsored spouses (who are not separately identified from kids in the data after 2004), but the second row of Table 2 shows that there are fewer than 0.6 Green Card sponsored relatives *in total* per Mexican IRCA LPR, making the combined rate of adult sponsorship below one. Similar calculations for Table 4 do rule out combined coefficients above one after including spouses for low naturalization rate countries (columns 4 and 5).

37% of naturalized IRCA LPRs sponsored the admission of one parent.<sup>39</sup> Potential sponsors may have fewer living parents than siblings, but this finding could also suggest they do not have strong demand for bringing extended family members to the U.S.

The fact that naturalization rates are not 100% – or anywhere near that – also suggests that a significant share of the legalized population is not willing to bear the costs of naturalizing to start new or perpetuate existing migratory chains. Or at least that appears the case in the present policy environment, where some relatives may not have the patience to wait 20 years to be admitted. Even though becoming a U.S. citizen affords certain sponsorship rights, the current system of strict quotas and long wait lists in some admissions categories, like that for siblings, makes those rights more difficult to exercise.

## VII. Conclusion

This paper provides the first causal estimates how the U.S. immigration system's preference for family reunification works in practice when the U.S. opens the door to countries that otherwise have little access to authorized immigration. We exploit variation from IRCA's legalization programs, which allowed a cohort of 2.7 million unauthorized immigrants – 2.02 million from Mexico alone – to obtain Green Cards over a narrow time frame starting in the late 1980s. Estimating the number of family-sponsored admissions caused by the IRCA cohort over a 30-year period and exploring underlying mechanisms, we add to a broader push to evaluate the impacts of immigration *policy* – not just immigration *flows* – for the host country.<sup>40</sup>

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<sup>39</sup> We make this calculation by dividing the  $\hat{\theta}$  for parents in Table 4 column 1 (0.22) by the predicted naturalization rate, 0.60. We arrive at this prediction by extrapolating the trend in naturalization rates of IRCA admissions between 2001 (33%, from Rytina (2002)) and 2009 (45%, from Baker (2010)) to 2019. The assumption that annual changes in the naturalization rate did not diminish between 2009 and 2019 is probably a generous one, making this calculation a likely lower bound. A comparable calculation yields a similar parental sponsorship among Mexican IRCA naturalized citizens.

<sup>40</sup> See, for example, Chen (2015), Foged and Peri (2016), Dustmann, Schönberg, and Stuhler (2017), Clemens, Lewis, and Postel (2018), Allen, Dobbin, and Morten (2019), Abramitsky et al. (2019), and Tabellini (2020). This

Our main approach, exploiting cross-metro area variation for Mexico, estimates about one additional admission – and one immigrant arrival – *in total* per Mexican IRCA LPR across three decades. Taken at face value, this estimate implies that IRCA induced about 2.08 million (2.02 x 1.03) subsequent arrivals from Mexico through 2019 by way of family sponsorship. These individuals would not have come to the U.S. absent family sponsorship, including through unauthorized channels. The number is substantial: indeed, our estimates imply that IRCA can account for 53% of family-sponsored Green Cards from Mexico since 1989. However, most sponsored family members (1.76 million) have been spouses and minor or unmarried children.<sup>41</sup>

Cross-country variation delivers similar conclusions and highlights the potential importance of demand-side factors. Naturalization rates among IRCA LPRs are low (Rytina, 2002; Baker, 2010), even though DHS explicitly promotes family sponsorship as a benefit of naturalization (e.g., DHS, 2016, p. 3). When IRCA LPRs have naturalized, moreover, they do not appear to bring quota-unrestricted relatives (parents) at particularly high rates. In addition, IRCA LPRs from countries that share Mexico’s low naturalization rate but not its long wait lists have not sponsored relatives for admission at a higher rate than Mexicans have, reinforcing that demand for sponsorship may be limited for immigrants that naturalize at low rates.

However, supply-side forces are also important. The fact that the family sponsorship response to IRCA legalization remained above zero in 2019 – and wait lists for sponsorship of certain relatives remain long – suggests that the quotas are binding constraints on sponsoring

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literature includes studies of IRCA itself (Kossoudji and Cobb-Clark, 2002; Amuedo-Dorantes et al., 2007; Pan, 2012; Cortes, 2013; Baker, 2015; Freedman, Owens, and Bohn 2018; Cascio and Lewis, 2019; Comino et al., 2020).

<sup>41</sup> In addition to endowing the admitted with sponsorship rights, IRCA has also been estimated to increase the earnings of those who gained legal status through its programs (e.g., Kossoudji and Cobb-Clark, 2002; Amuedo-Dorantes et al., 2007; Pan, 2012). Thus, our estimates may represent not just the direct effect of authorization to sponsor relatives, but also an indirect effect of higher income on demand for family sponsorship. We know of no estimates of how income affects family sponsorship rates, but income shocks appear to have little impact on duration of stay (Yang, 2006; Nekoei, 2013).

siblings and adult children. This is particularly true for Mexico, whose wait lists still include those who applied before 2000. The size of quotas relative to the size of a newly admitted population thus seems a central predictor of the rate at which a group will sponsor relatives.

From this understanding, we believe our findings speak to the consequences of recently proposed openings, such as the U.S. Citizenship Act of 2021 proposed by the Biden administration, which contains provisions like IRCA’s SAW and GLP provisions, or the U.S. House-passed Farm Workforce Modernization Act, which has a SAW-like provision. The unauthorized population in the U.S. is now more than triple the size of the IRCA cohort, while the quotas for family-sponsored admissions have not changed. This suggests that family sponsorship rates would not be any higher now than for those admitted under IRCA.<sup>42</sup> Biden’s proposal does include provisions to help clear wait lists, and it expands quotas, but the changes will far less than triple the number of family-sponsored admissions allowed annually. And while the mix of countries estimated to make up the unauthorized population has been shifting away from Mexico (Lopez et al., 2021; Baker, 2014), it remains dominated by countries with low naturalization rates. The estimates from this paper thus are likely to be an upper bound on the impact of a similar legalization program today.

Our estimates are embedded within the context of the U.S. immigration system, and thus may have less to say about the impact of similar openings outside the U.S. A broader lesson from our findings, however, is that demand-side factors, and not just quotas, are important predictors of the rate of family sponsorship. The design of legalization proposals might benefit from direct consideration of the demand for family sponsorship that they will induce.

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<sup>42</sup> Also, Latin American fertility rates have declined, so family sizes in today’s unauthorized population are likely smaller than when IRCA passed (see <https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=ZJ>, accessed 7/9/2021).

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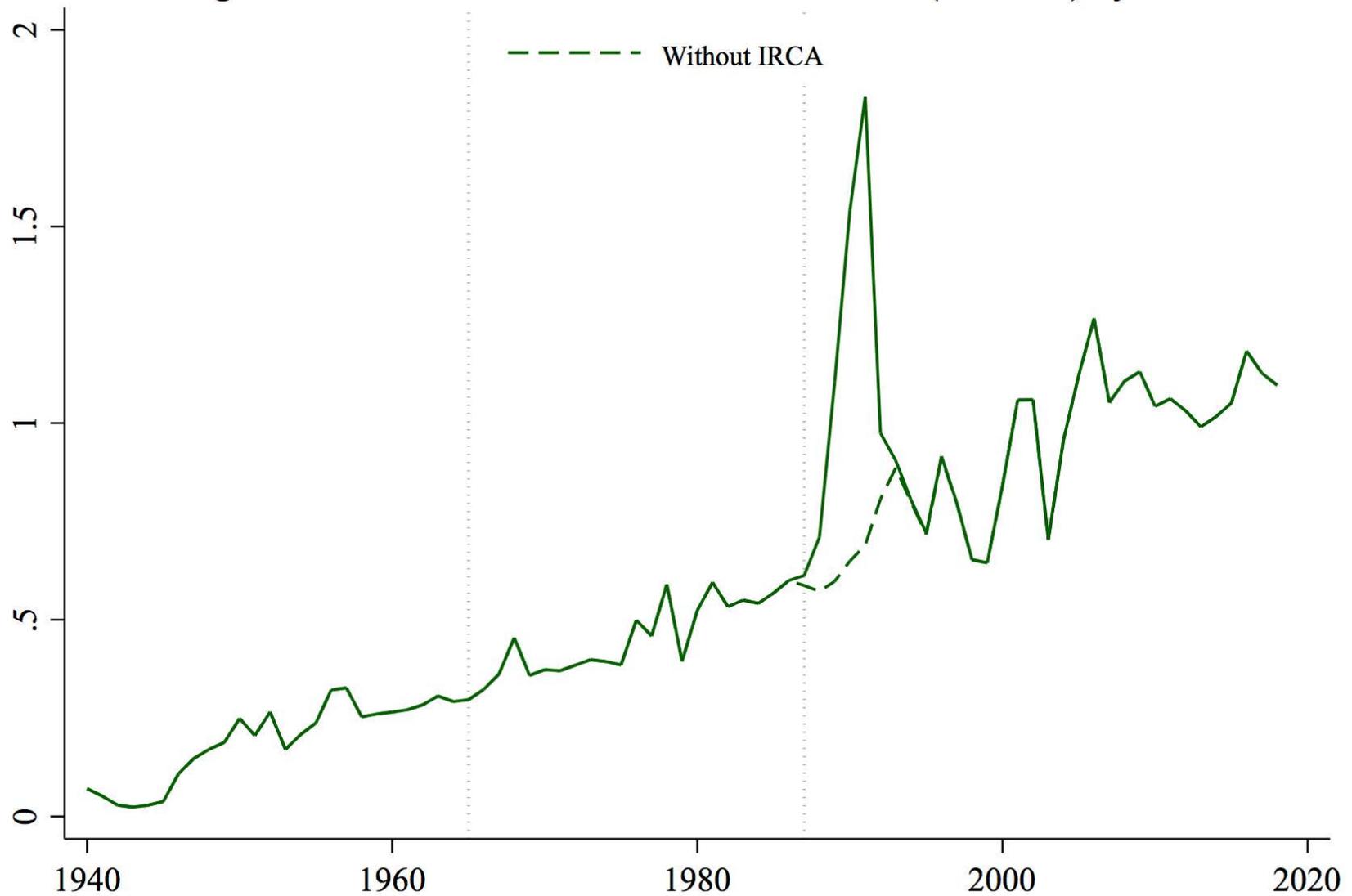
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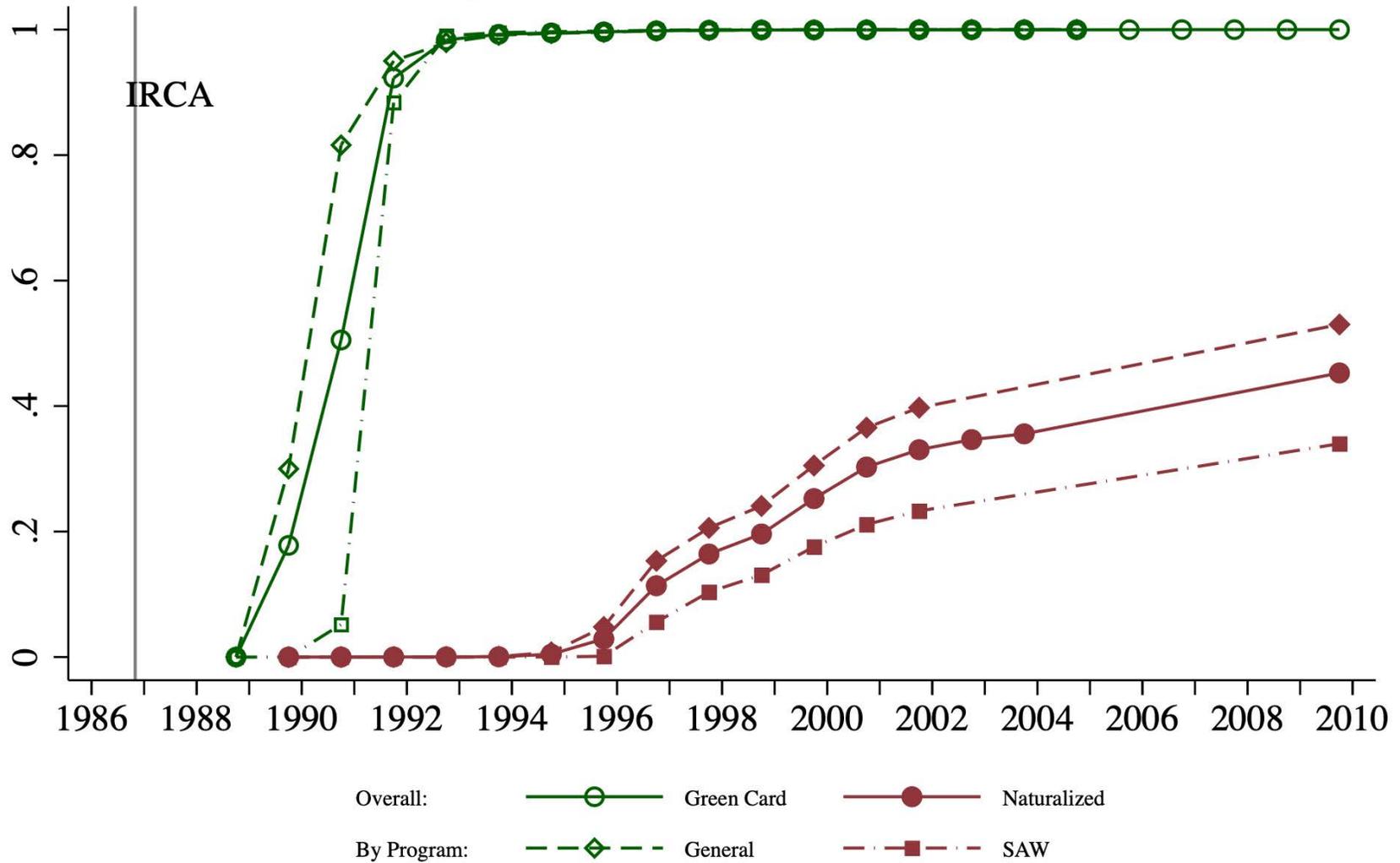
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Figure 1. U.S. Admissions: Green Cards Issued (Millions) by Year



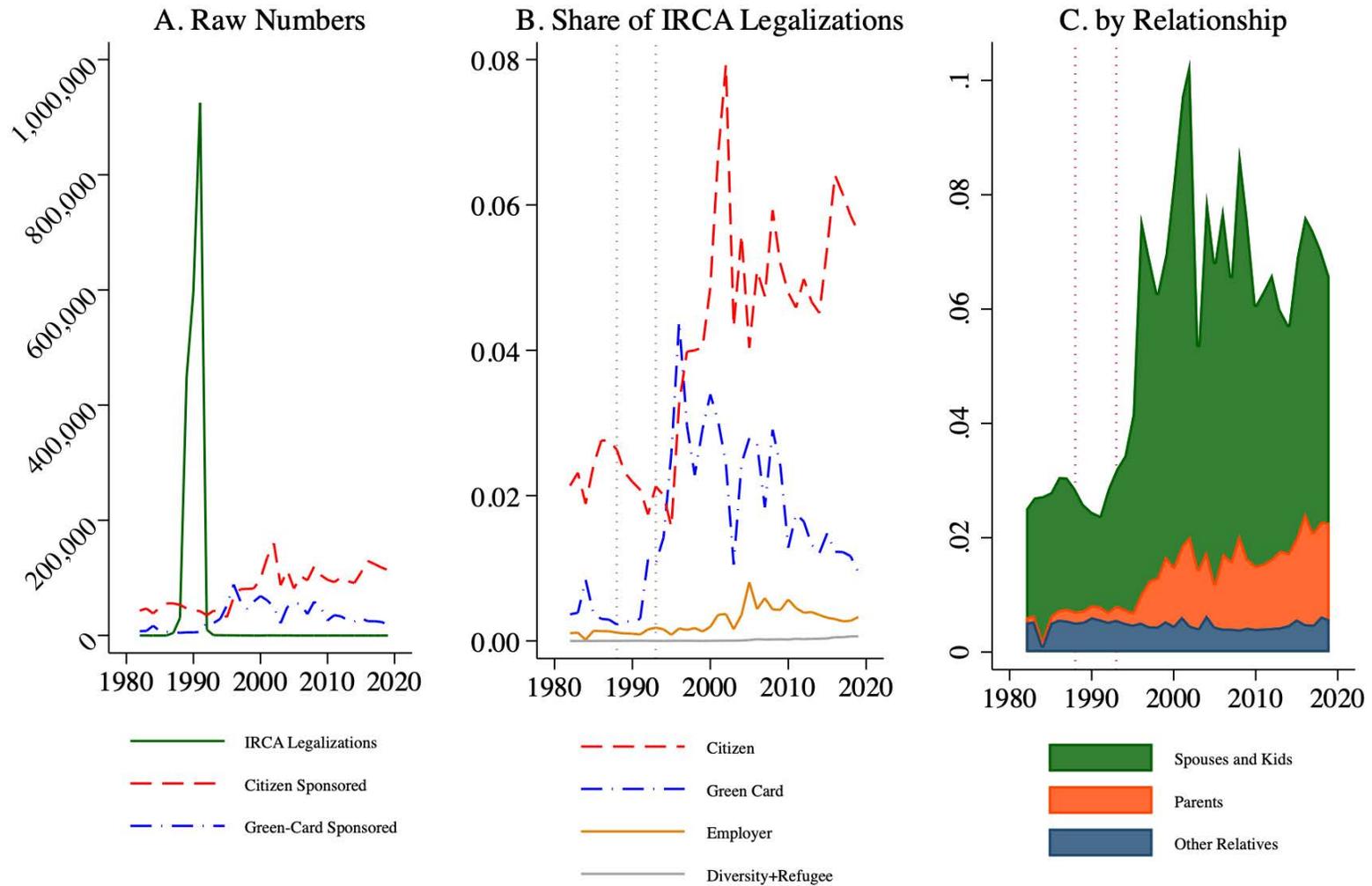
Notes: Authors' calculations using data on overall admissions from Table 1 of the *2018 Yearbook of Immigration Statistics* (<https://www.dhs.gov/immigration-statistics/yearbook/2018/table1>) and data on IRCA admissions from Rytina (2002) (for the SAW program and the GLP) and *Immigrants Admitted to the United States* (FY 1987-2004) (for two smaller IRCA programs).

Figure 2. Fraction of IRCA General Legalization and SAW Admits Receiving Green Card and Naturalized Over Time



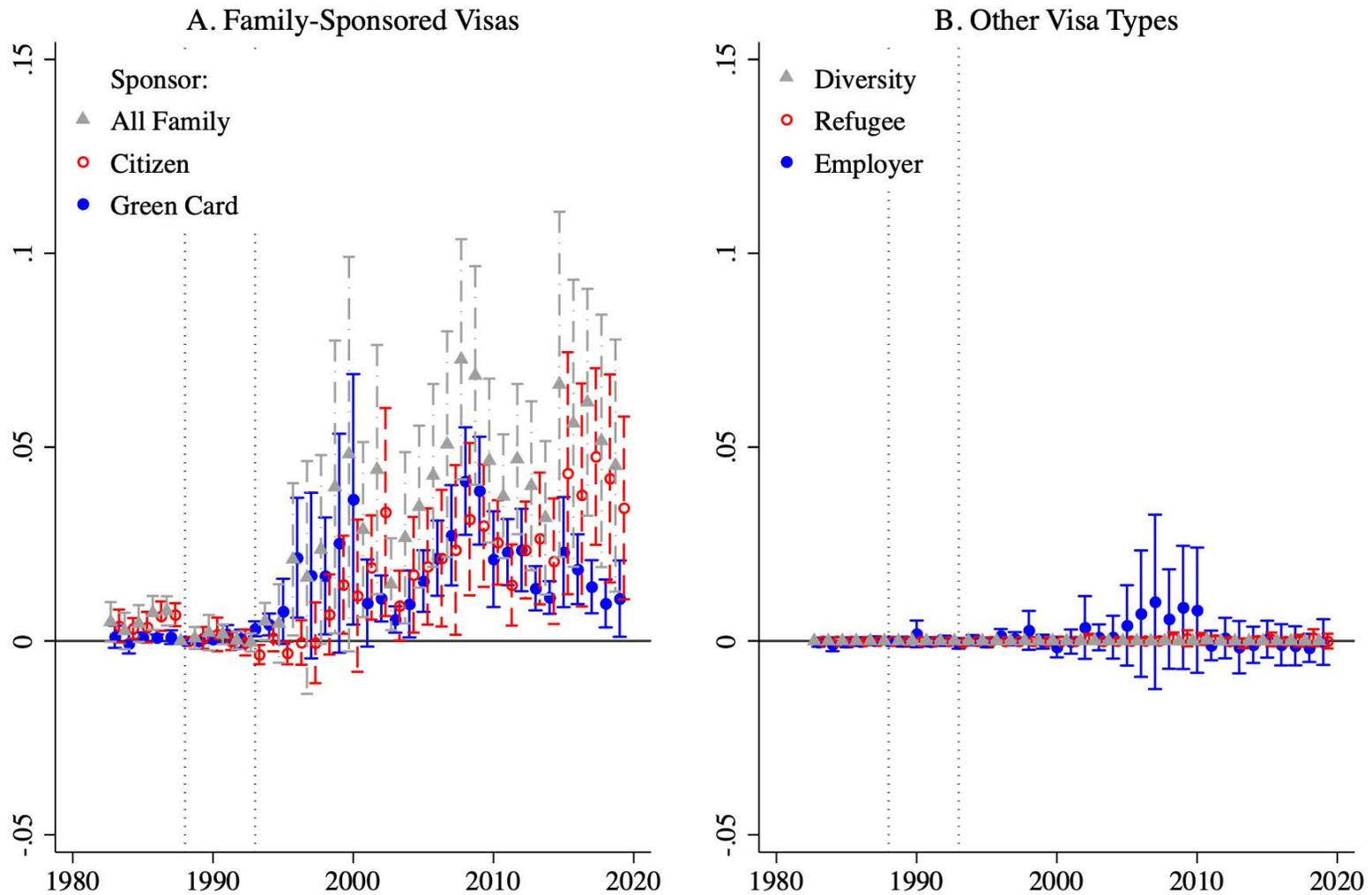
Notes: Points plotted at the end of the relevant fiscal year (FY). For IRCA admissions (Green Cards), data are from the *Yearbook of Immigration Statistics* (YIS); data by program (GLP, SAW) were last reported in FY 2004. For IRCA naturalizations, data are from Rytina (2002) through FY 2001, YIS for FY 2002 and 2003, and Baker (2010) for FY 2009.

Figure 3. Selected Mexican Admission Classes Over Time



Notes: Authors' tabulations using data on Mexican IRCA admissions from the Legalization Applications Processing System (for the SAW program and the GLP) and *Immigrants Admitted to the United States* (FY 1987-2004) (for two smaller IRCA programs) and data on other admissions from *Immigrants Admitted to the United States* (FY 1983-2004) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPR-by-major-class-and-country> (for FY 2005-2019). See Appendix A.

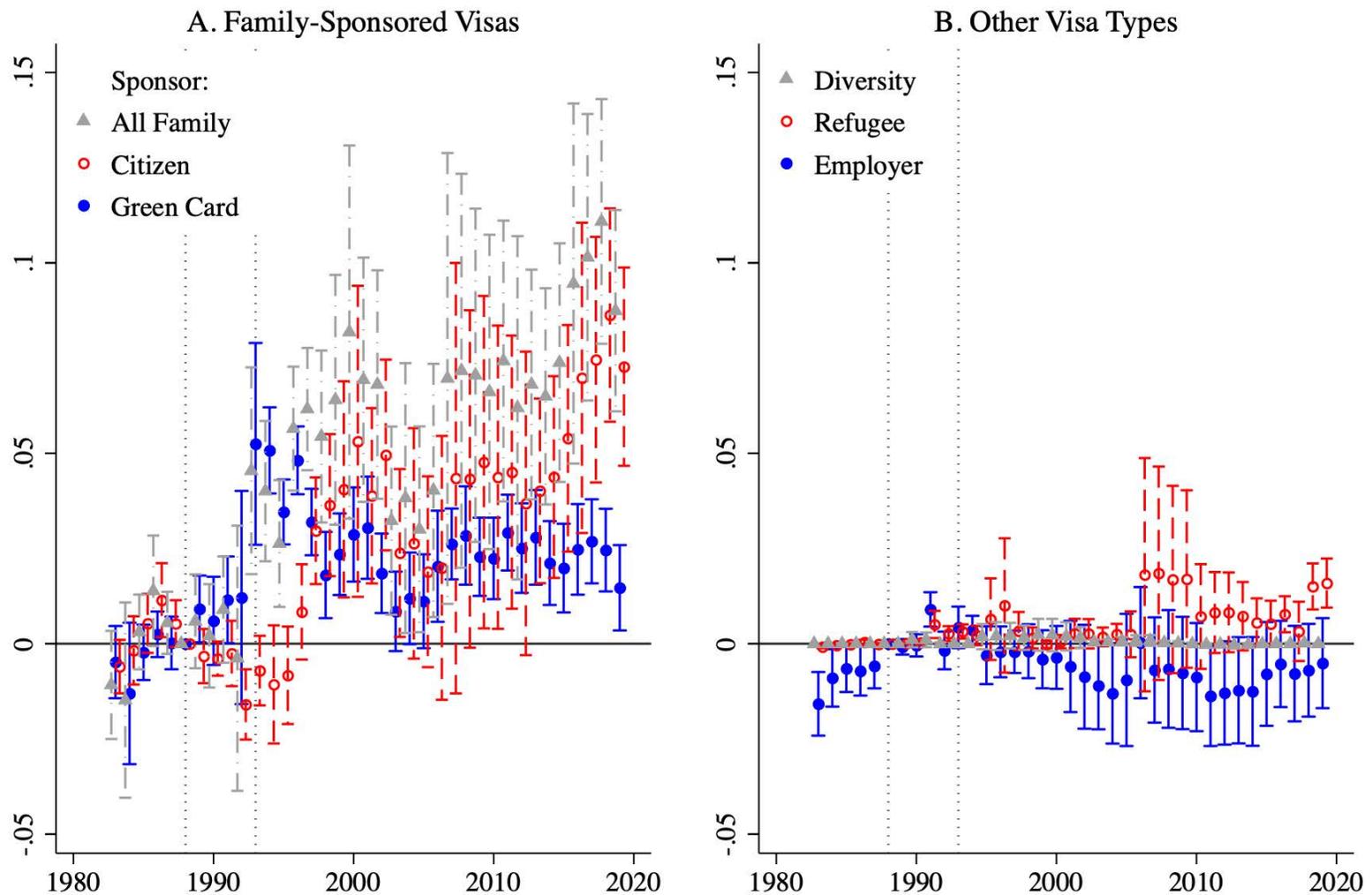
Figure 4. Response to Mexican IRCA Legalizations, by Visa Type and Year



Sources: See Table 1 Panel A source notes for legalization ratio. Data for admissions by type from *Immigrants Admitted to the United States* (FY 1983-2004) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPRcounty> (FY 2007-2019). Admissions for FY 2005 and 2006 are linearly interpolated. See Appendix A.

Notes: Figures plot coefficients (with 90% confidence intervals) on the Mexican legalization ratio ( $lpr_{c,IRCA}/legal_{c,1980}$ ) interacted with year dummies from a regression that also includes metro area and year-by-state fixed effects; the interaction between the legalization ratio and the dummy for 1988 is omitted to identify the model (equation 1). Regressions give each metro area equal weight, and standard errors are clustered on metro area. Estimation sample includes the 66 metro areas listed in Table A2.

Figure 5. Response to IRCA Legalizations Across Countries, by Visa Type and Year



Sources: See Table 1 Panel A source notes for legalization ratio. Data for admissions by type from *Immigrants Admitted to the United States* (FY 1983-2004) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPR-by-major-class-and-country> (for FY 2005-2019). See Appendix A.

Notes: Figures plot coefficients (with 90% confidence intervals) on the legalization ratio ( $lpr_{c,IRCA}/legal_{c,1980}$ ) interacted with year dummies from a regression that also includes country and year-by-world region fixed effects; the interaction between the legalization ratio and the dummy for 1988 is omitted to identify the model (equation 1). Regressions give each country area equal weight, and standard errors are clustered on country. Estimation sample includes the 29 countries listed in Table A7.

Table 1. Cross-Metro Area Variation in IRCA Legalizations among Mexicans

<i>A. Top MSAs on Mexican Legalization Ratio</i>				
Metro Area	Legalization Ratio: (2)/(3)	Legalized by IRCA	Legal Immigrants, 1980	% of Legalizations
	(1)	(2)	(3)	(4)
1 Lakeland-Winter Haven, FL	8.4	4,162	495	0.21
2 Fort Myers-Cape Coral, FL	6.9	1,958	282	0.10
3 Fort Pierce-Port St. Lucie, FL	5.7	898	157	0.04
4 Reno, NV	5.0	3,377	676	0.17
5 Naples, FL	4.4	5,428	1,241	0.27
6 West Palm Beach-Boca Raton, FL	3.8	4,103	1,077	0.20
7 Sarasota-Bradenton, FL	3.6	1,286	362	0.06
8 Fort Lauderdale, FL	3.4	1,462	432	0.07
9 Santa Rosa, CA	3.1	8,362	2,675	0.41
10 Monmouth-Ocean, NJ	2.7	300	110	0.01
16 Los Angeles-Long Beach, CA	1.7	560,289	329,865	27.8

<i>B. Balance Test: Correlates of the Legalization Ratio</i>				
Characteristic	Mean	Regressions on Leg. Ratio		Reverse
	(1)	(2)	(3)	(4)
(a) Mexicans/Population, 1980	0.0290	-0.00465 (0.00211)	0.00106 (0.00157)	1.719 (2.297)
(b) Mexicans Admitted, 1983-87 /Legal Mexicans, 1980	3.844	0.0149 (0.488)	0.649 (0.488)	0.0124 (0.0196)
(c) Employment Growth, 1980-87	0.258	0.0412 (0.0188)	-0.0109 (0.0230)	-1.013 (2.164)
(d) Mex Emp Growth, 1980-2019 predicted from 1980 Occ Mix	5.452	-0.195 (0.492)	0.441 (0.755)	0.0151 (0.0330)
State Effects?		No	Yes	Yes
F-stat				0.578

*Sources:* Panel A columns 2 and 4: Legalization Applications Processing System (LAPS) (for the SAW program and the GLP) and *Immigrants Admitted to the United States* (FY 1987-2004) (for two smaller IRCA programs). Panel A column 3: *Alien Address Reports, [United States], 1980 Public Use File* (for LPRs) and 1980 Census PUMS (Ruggles et al., 2020) (for citizens). Panel B row a: 1980 Census tabulations (Manson et al., 2020). Panel B row b: *Immigrants Admitted to the United States*, FY 1983-87 (numerator) and Panel A column 3 sources (denominator). Panel B row c: County Business Patterns. Panel B row d: 1980 Census PUMS and 2018-19 American Community Surveys (Ruggles et al, 2020). See Appendix A.

*Notes:* The unit of observation is a metro area. The legalization ratio in Panel A is the number of Mexican immigrants granted permanent residence by IRCA who listed that metro area as their intended residence, divided by the number of Mexican citizens and LPRs in that metro area in 1980. Columns 2 and 3 of Panel B show the coefficient from a regression of the variable listed on the legalization ratio; the regression in column 3 also includes dummies for the state in which the majority of the metro area's population resided in 1986. Column 4 of Panel B shows the slope coefficients from a multivariate regression of the legalization ratio on the variables listed plus state dummies; the F-stat is on the joint significance of the variables listed.

Table 2. Long-Run Response to IRCA Legalizations of Mexicans: Metro Area Evidence

	Baseline	Weighted	Adding controls
	(1)	(2)	(3)
Overall Family Sponsored	1.03 (0.25)	0.88 (0.37)	1.01 (0.20)
<i>By Family Sponsorship Type</i>			
Green-Card Sponsored	0.48 (0.09)	0.39 (0.13)	0.49 (0.08)
Citizen-Sponsored	0.55 (0.18)	0.50 (0.26)	0.52 (0.15)
<i>By Relative Type</i>			
Spouses and Kids <sup>a</sup>	0.87 (0.20)	0.76 (0.30)	0.84 (0.16)
Parents	0.12 (0.05)	0.12 (0.06)	0.13 (0.04)
Other Relatives <sup>b</sup>	0.03 (0.02)	0.01 (0.02)	0.03 (0.01)
<i>Other Major Categories</i>			
Employer-Sponsored	0.05 (0.09)	0.20 (0.19)	0.02 (0.05)
Refugees	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Diversity	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Weights:	None	1980 Pop	None
Controls			
State x Year	Yes	Yes	Yes
Other Controls <sup>c</sup>	No	No	Yes

*Sources:* See Table 1 Panel A source notes for legalization ratio and other controls. Data on admissions by type from *Immigrants Admitted to the United States* (FY 1983-2004) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPRcounty> (FY 2007-2019). Admissions for FY 2005 and 2006 are linearly interpolated. See Appendix A.

*Notes:* The cross-section unit of analysis is a metro area. Baseline regression (column 1, based on equation 1) includes metro area fixed effects, state-by-year fixed effects, and interactions between the legalization ratio ( $lpr_{c,IRCA}/legal_{c,1980}$ ) and year indicators. Table entries report the sum of the post-1988 interaction coefficients for the variable listed (divided by  $legal_{c,1980}$ ), based on data for 66 metropolitan areas across 37 years (1983-2019). Unless otherwise noted (column 2), regressions give each metro area equal weight. Standard errors in the underlying regressions are clustered on metro area, and standard errors in parentheses are calculated using the delta method.

<sup>a</sup> Sum of citizen-sponsored spouses and minor children and Green Card-sponsored spouses, minor children, and unmarried children.

<sup>b</sup> Siblings, married children, and citizen-sponsored unmarried adult children.

<sup>c</sup> Interactions between year dummies and the variables listed in Table 1 Panel B.

Table 3. Long-Run Response to IRCA Legalizations by Arrival Mode

	All Arrivals	Overall Admissions	Other Arrivals, (1) – (2)
	(1)	(2)	(3)
<i>A. Across Metropolitan Areas (Mexico only)</i>			
Cumulative Response	1.23 (0.98)	1.04 (0.32)	0.20 (0.82)
MSAs	63	63	63
Controls			
State x Year?	Yes	Yes	Yes
Other Controls? <sup>a</sup>	Yes	Yes	Yes
<i>B. Across Countries</i>			
Cumulative Response	1.24 (1.00)	1.80 (0.67)	-0.57 (1.14)
Countries	29	29	29
Controls			
Region x Year?	Yes	Yes	Yes

*Sources:* See Table 1 Panel A source notes for legalization ratio and for the other controls in the metro area analysis (Panel A). Sources for other controls in the country analysis (Panel B) are in Appendix A. Data on all arrivals (column 1) are from the 1990 and 2000 Census and 2016-19 ACS (Ruggles et al., 2020) and are linearly adjusted for years in the U.S. as described in Appendix A. Data on overall admissions (column 2) are from *Immigrants Admitted to the United States* (FY 1983-2004) for both metro areas (Panel A) and countries (Panel B) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPRcountry> for metro areas (FY 2007-2019) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPR-by-major-class-and-country> for countries (for FY 2005-2019). Admissions for FY 2005 and 2006 are linearly interpolated in the metro area analysis.

*Notes:* The cross-section unit of observation is metro area (Mexicans only) in Panel A and country in Panel B. Underlying regressions in Panel A include metro area fixed effects, state-by-arrival year bin fixed effects, and interactions between the legalization ratio ( $lpr_{c,IRCA}/legal_{c,1980}$ ) and arrival year bin indicators. Underlying regressions in Panel B include country fixed effects, world region-by-arrival year bin fixed effects, and interactions between the legalization ratio and arrival year bin indicators. Arrival bins are 1982-84, 1985-86, 1987-89, and five-year intervals thereafter (except for the last bin, 2015-2018), to accommodate reporting of arrival year in the 1990 Census; interactions with 1987-89 are omitted to identify the model. Table entries report the sum of the post-1987-89 interaction coefficients for the variable listed (divided by  $legal_{c,1980}$ ). Regressions in Panel A are based on data for 66 metro areas across 37 years (1983-2018); regressions in Panel B are based on for 29 countries across 36 years (1983-2018). Standard errors in the underlying regressions are clustered on metro area (Panel A) or country (Panel B), and standard errors in parentheses are calculated using the delta method.  
<sup>a</sup> Interactions between arrival year bin dummies and the variables listed in Table 1 Panel B.

Table 4. Long-Run Response to IRCA Legalizations: Country Evidence

	Baseline	Nonmissing Controls	With Controls	<60% Citizens by 2000	Dropping Mexico
	(1)	(2)	(3)	(4)	(5)
Overall Family Sponsored	1.74 (0.43)	1.83 (0.44)	1.66 (0.37)	1.11 (0.24)	1.14 (0.23)
<i>By Family Sponsorship Type</i>					
Green-Card Sponsored	0.74 (0.14)	0.78 (0.15)	0.75 (0.06)	0.49 (0.09)	0.46 (0.07)
Citizen-Sponsored	1.00 (0.41)	1.06 (0.40)	0.91 (0.36)	0.63 (0.26)	0.68 (0.25)
<i>By Relative Type</i>					
Spouses and Kids <sup>a</sup>	1.23 (0.31)	1.29 (0.33)	1.19 (0.25)	0.79 (0.19)	0.81 (0.21)
Parents	0.28 (0.07)	0.29 (0.07)	0.26 (0.07)	0.19 (0.07)	0.20 (0.07)
Other Relatives <sup>b</sup>	0.23 (0.10)	0.26 (0.09)	0.22 (0.09)	0.12 (0.11)	0.14 (0.09)
<i>Other Major Categories</i>					
Employer-Sponsored	-0.17 (0.18)	-0.15 (0.15)	-0.21 (0.12)	-0.35 (0.13)	-0.36 (0.12)
Refugees	0.20 (0.13)	0.21 (0.13)	0.19 (0.13)	0.09 (0.05)	0.09 (0.06)
Diversity	0.02 (0.02)	0.02 (0.02)	0.02 (0.03)	0.00 (0.00)	0.00 (0.00)
Countries:	29	27	27	14	13
Fixed Effects					
Country	Yes	Yes	Yes	Yes	Yes
Region x Year	Yes	Yes	Yes	Yes	Yes
Baseline Controls x Year <sup>c</sup>	No	No	Yes	No	No
Time-Varying Controls <sup>d</sup>	No	No	Yes	No	No

*Sources:* See Table 1 Panel A source notes for legalization ratio. Data on admissions by type from *Immigrants Admitted to the United States* (FY 1983-2004) and <https://www.dhs.gov/immigration-statistics/readingroom/LPR/LPR-by-major-class-and-country> (for FY 2005-2019). See Appendix A for more details and sources for controls.

*Notes:* The cross-section unit of analysis is a country. Baseline regression (column 1, based on equation 1) includes country fixed effects, world region-by-year fixed effects, and interactions between the legalization ratio ( $lpr_{c,IRCA}/legal_{c,1980}$ ) and year indicators. Table entries report the sum of the post-1988 interaction coefficients for the variable listed (divided by  $legal_{c,1980}$ ) based on data for 29 countries across 37 years (1983-2019). Regressions give each country equal weight. Standard errors in the underlying regressions are clustered on country, and standard errors in parentheses are calculated using the delta method.

<sup>a</sup> Sum of citizen-sponsored spouses and minor children and Green Card-sponsored spouses, minor children, and unmarried children.

<sup>b</sup> Siblings, married children, and citizen-sponsored unmarried adult children.

<sup>c</sup> Interactions between year dummies and each of 1983-87 LPR admissions per 1980 legal immigrant and a dummy for upper income country.

<sup>d</sup> Annually varying real exchange rate and population (divided by  $legal_{c,1980}$ ), lagged one year.