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Two Decades of Negative Educational Selectivity of Mexican Migrants to the United States

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Abstract

Immigration is commonly considered to be selective of more able individuals. Studies comparing the educational attainment of Mexican immigrants in the United States to that of the Mexican resident population support this characterization. Upward educational-attainment biases in both coverage and measurement, however, may be substantial in U.S. data sources. Moreover, differences in educational attainment by place size are very large within Mexico, and U.S. data sources provide no information on immigrants' places of origin within Mexico. To address these problems, we use multiple sources of nationally-representative Mexican survey data to re-evaluate the educational selectivity of labor-force-age Mexican migrants to the United States over the 1990s and 2000s. We document disproportionately rural and small-urban-area origins of Mexican migrants and a steep positive gradient of educational attainment by place size. We show that together these conditions induced strongly negative educational selection of Mexican migrants throughout the 1990s and 2000s. We interpret this finding as consistent with low returns to the education of unauthorized migrants and few opportunities for authorized migration.

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INTRODUCTION

Mexican migration to the U.S. has constituted by far the largest single country-to-country flow of international migrants to a developed country over the last two decades. In 2000/2001, the United States accounted for 42% of the total stock of immigrants across OECD countries (Belot and Hatton 2012). Mexico at that time accounted for 30% of the U.S.'s foreign-born population, six times more than the next largest country, which was China at 5% (U.S. Bureau of the Census 2003). Because many Mexican migrants stay short periods in the U.S., they constitute an even larger share of its immigrant flow (Passel and Suro 2005). From Mexican data sources, 1.2 million Mexican-born individuals were estimated to have migrated to the United States in 2000, and more than 1 million in each of the next three years (Fernandez-Huertas Moraga 2011). This was larger than the combined flow of all other countries in this period, as measured by U.S. data sources (Passel and Suro 2005). The total Mexican-born population resident in the U.S. almost tripled in size over these two decades, from 4.5 million in 1990 to 12.3 million in 2010 (Passel, Cohn, and Gonzalez-Barrera 2012).

The education of Mexican immigrants is important for both their contributions to the U.S. labor force (Borjas 1995) and for their contributions as parents of second-generation immigrants, whose outcomes as children and adults have been the subject of considerable concern (e.g., Landale, Oropesa, and Llanes 1998). The Mexican population is substantially less educated than the U.S. population, and this has been claimed to be the major reason for the U.S.'s overall less educated immigrant population compared to other countries that are large receivers of immigrants (Antecol, Cobb-Clark, and Trejo 2003). Buttressing this argument that low educational attainment of Mexican migrants is due to the overall low educational attainment of Mexican residents, and not to negative selection into migration, Feliciano (2005, 2008) compared Mexican immigrants in U.S. Censuses to Mexican residents observed in Mexico's contemporaneous Censuses and concluded that educational selection has been consistently positive from 1960 through 2000. Similarly, Chiquiar and Hanson (2005) characterized their findings from 1990 and 2000 U.S. and Mexican Censuses as intermediate-to-positive with respect to selectivity on education and earnings.

Studies using nationally-representative Mexican data sources, however, have found Mexican migrants to the U.S. to be instead negatively selected from all Mexican residents (Ibarraran and Lubotsky 2007; Fernandez-Huertas Moraga 2011; Ambrosini and Peri 2012). The importance of this finding should not be understated. The theory of positive selection of migrants from their country of origin has a long history in economics (Sjaasted 1962, Chiswick 1999) and is similarly favored in sociology (Portes and Rumbaut 1996). Empirically, the evidence for positive international migrant selection is very strong. Feliciano (2005) found higher educational attainment among immigrants in the U.S. in 2000 than the average educational attainment in all 31 sending countries for which those data were available. Similarly, Aleksynka and Tritah (2013) found higher proportions with a tertiary education among immigrants in 22 European countries than in the home country for 73 out of 76 sending countries.

In the present study, we attempt a more extensive estimation of the educational selectivity of Mexican migrants to the United States than has previously been attempted from nationally-representative Mexican data sources. Although several studies have used Mexican Migration Project (MMP) data to evaluate trends in Mexico-U.S. migration (see Durand and Massey 2004), those data are only designed to be representative at an immigrant sending-community level. A major insight provided by the studies of Ibarraran and Lubotsky and of Fernandez-Huertas Moraga is that the disproportionately rural origins of Mexican migrants can explain much of the overall negative selectivity. Indeed, by using Mexican census data to break down the place-size origins of Mexican migrants much more finely, Ibarraran and Lubotsky concluded that migrants were positively selected by education at all place sizes, but that the lower overall education of smaller places dominated within-place-size selectivity to generate overall negative educational selectivity. We follow Ibarraran and Lubotsky's and Fernandez-Huertas Moraga's focus on the place-size origins of Mexican migrants as a fundamental means of understanding educational selectivity of all Mexican migrants to the U.S. Whereas Fernandez-Huertas Moraga considered only rural versus urban migration, however, we divide urban migrant sources into three categories and find that the smaller urban categories both contribute proportionately more migrants and have correspondingly lower educational attainment. Whereas Ibarraran and Lubotsky rely solely on imputed educational attainment of migrants, we use a mixture of observed and imputed educational attainment in our results. Finally, whereas Fernandez-Huertas Moraga and Ibarraran and Lubotsky focus on migration occurring in the years immediately before or after the likely peak migration year of 2000 (Passel and Suro 2005), our analysis spans the entire 1990s and 2000s decades.

We address the question of the educational selectivity of working-age migrants with Mexican data from specialist household demographic surveys, large-scale household employment and population surveys, a migration border survey, and from a panel survey designed to follow emigrants from Mexican households after they moved to the U.S. Together these surveys cover the period 1987 to 2010. All these data sources are by their design nationally representative in scope. Typically for data sources on international migration (Bilsborrow et al 1997), each is more representative of some types of migration flows and less representative of other types. Together, however, they allow us to re-evaluate Mexican working-age immigrant educational selectivity more thoroughly and robustly than has been possible in previous studies using either U.S. or Mexican data sources. To anticipate our results, we find remarkable stability in the place-size composition of Mexico's migrants to the U.S., strongly favoring rural and small-urban places throughout the 1990s and 2000s. We document a very steep positive educational gradient of the resident population by place size. The combined force of these two phenomena produces a strong negative educational selectivity of migrants with respect to the overall Mexican population from which migrants are drawn. Particularly striking is our finding of a consistently much lower proportion of migrants than residents with any upper secondary school education. An implication of this is that upwards of half of the very low proportion of Mexican migrants with the U.S. equivalent of a high school graduate education is accounted for by the consistently low relative probability that a Mexican resident with at least that level of education would migrate to the U.S.

Literature Review

Immigration has commonly been considered to be selective of healthier and more able individuals who are motivated by greater opportunities in the destination country (e.g., Portes and Rumbaut 1996). The hypothesis of positive immigrant self-selection also follows from the theory of immigration as an investment most likely to be undertaken by individuals whose labor-market characteristics produce the highest return on that investment (Chiswick 1999). Immigrants are hypothesized to be less positively self-selected when, due to geographical proximity, the cost of investing in migration is lower (Sjaasted 1962, Grogger and Hanson 2011).

As we noted above, the conclusions about the direction of migrant selectivity in empirical studies of Mexico-U.S. immigration depend strongly on whether U.S. or Mexican data are used to estimate the education of migrants. To explain this discrepancy, both Fernandez-Huertas Moraga (2011) and Ibarraran and Lubotsky (2007) attributed the positive educational selectivity findings of studies using U.S. data to a combination of coverage and measurement biases in those data sources. On coverage biases, Lindstrom and Massey (1994) concluded that the lower education among Mexican Migration Project data (MMP) migrants surveyed in the U.S. than among Mexican immigrants surveyed in the 1990 U.S. Census was likely due to under-coverage of less educated migrants in the Census. Fernandez-Huertas Moraga found that coverage of Mexican migration in the U.S. American Community Survey (ACS) and Current Population Survey (CPS) was approximately half the level estimated from the ENE. Ibarraran and Lubotsky (2007) also noted that differences in Mexican and U.S. school systems may lead to over-reporting of high school graduate levels of educational attainment among Mexican-born individuals in U.S. data sources. Moreover, they noted that the Census Bureau’s imputation of education for as many as a quarter of Mexican-born individuals in the U.S. from the education distributions of all Hispanics living in the U.S. is similarly likely to inflate the education levels of Mexican immigrants. Chiquiar and Hanson (2005) acknowledged an additional bias due to schooling years obtained in the U.S. potentially inflating the educational attainment of Mexican migrants.

The studies so far of educational selectivity based on Mexican data sources, however, are also not without their limitations. Education is not reported for migrants who are no longer in the Mexican Census household, leading Ibarraran and Lubotsky (2007) to impute all migrants’ education based on non-migrants of similar ages, genders, household characteristics, and locations. This analysis is useful for understanding the selectivity of the geographical origins of Mexican migrants, but is of questionable validity for understanding the selectivity of individual migrants. In particular, dynamics within families in which a sibling who does less well at school is more likely to choose migration to the U.S., as suggested by the ethnographic findings of Kandel and Massey (2002), will not be captured by their imputation method. Fernandez-Huertas Moraga’s (2011) analyses of the ENE are limited to quarterly emigration, cover only the 2000-2004 period, and divide Mexico’s communities only dichotomously into rural (population <

2,500) versus urban place size. Finally, both studies relied on the presence of a non-migrating family member in the household to report on moves to the U.S. by other family members. Studies using the Mexican Family Life Survey (e.g., Ambrosini and Peri 2012) suffer from having too few migrants for detailed analyses by place size to be feasible, and a long (3-year) migration interval that may confound propensities to emigrate with propensities to return.

Our objective is to estimate the difference of the educational distribution of Mexican migrants to the U.S. from that of all Mexican residents of the same ages or birth cohorts. This objective defines our study's concept of migrant educational selectivity as a primarily demographic one. It allows for an examination of two sources of migrant selectivity, geographical sources and behavioral sources. The main geographical source of migrant educational selectivity will be seen to be the degree to which Mexican migrants to the U.S. come from rural and smaller-urban areas, where educational attainment is much lower. A significant behavioral source will be shown to be migrant gender, in the context of higher male proportions of migrants and differences between male and female migrant educational selection such that female migrants are more positively selected on education than are male migrants (Kanai'apuni 2000; Feliciano 2008). Both geographical and gender composition of migrants from Mexico have been described by previous authors as having changed over the period of our study, and in directions that would be expected to make educational selectivity more positive over the period.

Several recent studies have analyzed what appear to be increasing shares of urban migrants (e.g., Fussell 2004; Hamilton and Villarreal 2012). A trend toward a greater share of urban migrants has been described from several data sources that are not designed to be nationally representative with respect to Mexican migrants or households (e.g., Marcelli and Cornelius 2001; Garip 2012). We have not found studies that have shown clear trends towards more urban origins of migration when estimated from nationally-representative data sources. Durand, Massey, and Zenteno (2001), using the nationally-representative 1992 National Survey of Demographic Dynamics (ENADID) to analyze labor migrants, found similar distributions of migrants by place-size in the early 1990s as in the early 1970s, with almost two thirds of migrants originating from places with fewer than 15,000 people, although they also found evidence of increases in migration from places with populations above 100,000 through the late 1980s. Similarly, an evolution of an increasing female share of migrants from Mexico has also been described (e.g., Kanai'apuni 2000), but again without reference to nationally-representative data sources. Durand et al's (2001) analyses of ENADID labor migrants found no such trend to have occurred between the early 1970s and the early 1990s. If female migration is predominantly driven by family unification reasons (Cerrutti and Massey 2001), though, it is not clear that such an evolution would be captured in a labor-migrant data series.

As a major part of evaluating whether and what changes in educational selectivity occurred over the period, we estimate from nationally-representative Mexican data sources whether and how both the place-size and gender distributions changed over the 1990s and 2000s. Contrary to the above-cited studies, we find remarkable stability in the proportions of migrants from rural and urban Mexico with, if anything, an increased tendency for migrants to come from rural and small-urban places. We find remarkable stability also in the dominance of male migrants in the flows over the 1990s and 2000s.

DATA AND METHODS

As noted above, our objective is to understand how the educational distribution of working-age Mexican migrants to the U.S. differs from the educational distribution of all

Mexican residents of the same ages or birth cohorts. We use six nationally-representative Mexican data sources covering the 1990s and 2000s. Details of the data sources are provided in Appendix 1. Our unifying data source over this period is the National Survey of Population Dynamics (ENADID, INEGI 2003a), conducted in 1992, 1997, 2006, and 2009. We include in our ENADID series also the 2002 National Employment Survey (ENE) with its Migration Module that is based on that of the ENADID (INEGI 2004). This ENADID/ENE 1992-2009 series gives us five time points over the 1990s and 2000s from which we make generalizations about changes to both the Mexican resident population age 18 to 54 and to emigrants to the U.S. over these two decades. We obtain our overall migrant distributions by place-size and socio-demographic characteristics (not including education) from the section of the ENADID/ENE questionnaire that reports on all migrants from each responding household, not only those who migrated for work or to look for work, and not only those whose migration is temporary ('circular' migrants). This series allows us to document the place-size origins of all emigrants to the U.S., something not possible with U.S. data sources on immigrant flows from Mexico, but that constitutes a core element of our analysis of migrant selectivity. The ENADID/ENE 1992-2009 series also produces much larger estimated Mexico-U.S. migration flows than do corresponding U.S. data sources. This constitutes a second core element of our analysis, especially given concerns that U.S. data sources may disproportionately omit less educated migrants.

The third core element of our analysis is that, addressing the problem that U.S. data sources may capture poorly the educational attainment of Mexican immigrants, our analyses focus on educational attainment classifications that are meaningful in Mexico. All our data sources ask survey respondents to provide educational attainment in standard ways based on the Mexican educational system. From these we code five educational categories. Our highest educational attainment category consists of those who began upper secondary school ('preparatoria'), and who may or may not have completed it (equivalent to graduating from high school in the U.S.), and who may or may not have also gone on to college. We do not further sub-classify this group for two reasons. First, it allows us to start at as young as age 18 in defining the highest level of educational attainment. If not, we might encounter problems through estimating migration at ages at which educational attainment is still increasing. Second, the proportions of migrants with educational attainment in this highest category are relatively small, ranging in our estimates from 1 in 10 at the beginning of the 1990s to 1 in 4 at the end of the 2000s. The analytical benefits to further subdividing this group are therefore not especially great. We distinguish four categories of education below this highest level: those who did not complete elementary school ('primaria') and those who completed elementary school (and no more) as our first two categories, and those who started but did not complete lower secondary school ('secundaria') from those who completed lower secondary school. Since 1993, it has been legally mandated that all children in Mexico complete lower secondary school (Secretaria de Educacion Publica 1993), but we know of no evidence indicating that this law has been enforced.

The 1992-2009 ENADID/ENE series of surveys is unparalleled for its consistency in both migrant and resident data captured in nationally-representative Mexican surveys over the two decades. The series is not sufficient alone for our analysis, however, because educational attainment is collected consistently only for circular migrants. At none of the five time points in the series is educational attainment collected for the complete set of working-age migrants. We therefore use two alternate strategies to estimate migrant selectivity across the two decades. The first is to estimate the educational selectivity of working-age migrants across several nationally-representative Mexican data sources in which the educational attainment of migrants is observed directly for at least a subset of all migrants. These are the ENADID/ENE's circular migrants, observed in the five years before the 1992, 1997, 2002, and 2009 surveys, the intending migrants in the 1993 to 2004 series of border surveys known as the Survey of Migration at the North Border (EMIF, CONAPO 2008), migrants between the 2002 to 2005 waves of the Mexican Family Life Survey (MxFLS, Rubalcava and Teruel 2007), and quarterly migrants identified in the 2006 to 2010 National Survey of Occupation and Employment (ENOE, INEGI 2005). Because the border survey EMIF includes only migrants and not a comparison set of non-migrants, we use the 1990 and 2000 Mexican Censuses and the 1995 mid-decade Mexican micro-census ('Conteo', INEGI 2003b; Minnesota Population Center 2006) to estimate the educational and socio-demographic distributions of those at risk of labor-force-age migration. We restrict our EMIF migrants accordingly to three five-year birth cohorts, whose migration is observed between 1993 and 2004 at ages 18-34. In all other sources, we use ages 18-54.

Our second strategy for estimating migrant educational selectivity across the 1990s and 2000s period is to impute the educational distribution of all ENADID/ENE emigrants in 1992 to 2009 under the assumption of unchanging 'behavioral' selectivity (that is, conditional on age, gender, relationship to head, and place size) between the 1990s and 2000s (see Appendix 2 for details). The migrant behavioral selectivity parameters are estimated alternately from the three-year interval between the 2002 to 2005 waves of the MxFLS and from the quarterly interval over which migration events are identified in the 2006 to 2010 National Survey of Occupation and Employment (ENOE). Thus we exploit the differences between the longer-duration MxFLS and shorter-duration ENOE definitions of migration in robustness checks on these individual-level, 'behavioral' migrant selectivity parameters.

RESULTS

We present our results in five parts. First we describe the number and socio-demographic characteristics, including place-size composition, of migrants and of all Mexican residents, and we describe the differences in educational attainment of all residents by place-size. Both of these are described for five time points with consistently-defined variables and similar sampling designs over the 1992 to 2009 period. In the second through fourth parts, we present direct estimates of the educational selectivity, first of circular migrants in the ENADID/ENE surveys between 1992 and 2009, second of migrants captured in a border survey between 1993 and 2004, and third of migrants found in two household surveys in the 2000s, for whom education is reported. In the final part, we present estimates of educational selectivity of all migrants in the ENADID/ENE series of 1991/92 to 2008/09 years, for which we impute the educational attainment of the migrants.

Place-Size Composition of Migrants and Education Differences by Place-size, 1992-2009

The two decades of the 1990s and 2000s were marked by large changes in the sizes of annual emigration flows from Mexico to the U.S. but remarkably constant distributions of emigrants by place size and gender. Distributions of Mexican residents and of emigrants to the U.S. by place size and other sociodemographic characteristics as estimated from the ENADID/ENE series of surveys from 2002 to 2009 are shown in Table 1. We define an ‘emigrant’ as any person from the household who migrated to the U.S. in the 12 months before the survey. Total annual emigration of 18 to 54 year olds rose from 497,577 in the 1991/92 year to 636,642 in 1996/97 and 726,493 in 2001/02 before declining to 418,853 in 2005/06 and only 243,707 in 2008/09. These are consistently between 1.5 and 2 times higher than all-ages estimates from U.S. data sources (Passel and Suro 2005), but match the time trends from those same U.S. sources. Passel and colleagues (Passel et al 2012) subsequently updated their estimates of Mexican migration using Mexican data sources including the ENADID, and estimated similar levels of annual migration to those we report here.

[TABLE 1 ABOUT HERE]

In each of the five observed years from 1992 to 2009, consistently around two thirds of all emigrants had been residents of rural (population < 2,500) or small-urban (population 2,500 to 20,000) areas immediately before emigrating. Between 43 and 47% had been residents of rural areas in every year. These proportions are comparable to Ibarraran and Lubotsky's (2007) finding from analyses of the 2000 Mexican Census that 42.5% of male migrants age 16 to 54 departed from a rural household and Fernandez-Huertas Moraga's (2011) finding from the 2000 to 2004 National Employment Survey (ENE) that 43% of migrants of both sexes age 16 to 65 (45% of male and 34% of female migrants), departed from a rural household. The proportions of emigrants from rural Mexico were around double their shares of the Mexican population aged 18 to 54. The degree of urbanization in Mexico has been relatively high throughout the 1990s and 2000s (Anzaldo and Barron 2009). As seen in Table 1, only 25.2% of 18 to 54 year olds in 1992 lived in rural areas, falling further to 19.4% in 2009. Smaller urban areas (2,500 to 19,999 people) were also over-represented in their shares of migrants, with around one fifth of all emigrants but only one eighth of all 18 to 54 year old residents. The proportion of emigrants coming from large urban areas, meanwhile, declined from 26.3% in 1991/92 to 22.4% in 1996/97 and 19.1% in 2001/02, and remained in this one-fifth range in 2005/06 and 2008/09. Most of the population shift over this period was to medium-sized urban areas (populations between 20,000 and 99,999), which rose from 8.2% in 1992 to 14.6% of 18 to 54 year olds in 2009. The proportion of 18 to 54 year olds living in Mexico's larger urban areas (population > 100,000) was consistently just over 50% throughout the 1990s and 2000s. The over-representation of emigrants from rural and small-urban areas and corresponding under-representation of emigrants from large urban areas therefore appears to have increased slightly over the 1990s and 2000s.

Other noteworthy features of the composition of Mexico-U.S. migrant flows are the predominance of men and of undocumented migrants. Upwards of 80% of migrants were male throughout the 1990s and 2000s, with 2001/02 the peak at 87%. One caveat, however, is that female emigrants may be under-represented in the ENADID/ENE due to their being more likely to be last in the household to emigrate, leaving no one to report her move (Hill and Wong 2005). Regarding undocumented migrants, in the years 2002, 2006, and 2009, documentation status was asked of all emigrants in the ENADID/ENE series. The percentage undocumented increased from 80.5% to 84.7% between 2001/02 and 2005/06 before falling to 71.3% in 2008/09. Both these levels and trends are consistent with those reported elsewhere (Hanson 2006; CONAPO 2012).

As expected (Plane 1993), younger Mexicans are predominant among migrants throughout the 1990s and 2000s. Migrants ages 18 to 24 are consistently between 10 and 15 percentage points above their shares of the resident population, and migrants ages 34 to 54 consistently between 10 and 15 percentage points below their shares of the resident population. Finally, although we have no specific hypotheses about the educational selectivity of migrating household heads and spouses versus children of heads and other household members independently of age, we note that there were fluctuations over time in whether heads and spouses or children of heads were more likely to have migrated in the five observed 1990s and 2000s time points.

[FIGURES 1(A) TO 1(C) ABOUT HERE]

The importance of the disproportionately large shares of migrants from rural and small-urban Mexico for understanding migrant educational selectivity will depend on how steep are the gradients of the educational attainment of the resident population by place size. We present these for the beginning and end years 1992 and 2009 and the middle year 2002 of our ENADID/ENE series (see Figures 1(a) through 1(c)). Considerable educational progress occurred over the 1992 to 2009 period, but from a very low base especially in rural and small-urban areas. In 1992, more than four fifths (82.4%) of rural Mexicans aged 18 to 54 had not progressed beyond elementary school, whereas this was true for under two fifths (38.3%) of Mexicans aged 18 to 54 who in 1992 were living in large urban areas, but for 63.6% in small urban areas. Even in 2009, the majority of rural 18 to 54 year olds (54.2%) had not progressed beyond elementary school, whereas this was true for under a fifth (18.0%) of those living in large urban areas, but for 36.7% in small urban areas. The proportion of 18 to 54 year olds who had progressed to upper secondary school was still only 17.8% in rural Mexico in 2009, compared to 55.8% of 18 to 54 year olds living in large urban areas. Throughout the 1990s and 2000s, there was a steep educational gradient by size of place. For example, in 2002 the percentage of 18 to 54 year olds with no more than an elementary school education was 69.7% in rural areas, 50.4% in small urban areas (population 2,500 to 19,999), 40.1% in medium-sized urban areas (population 20,000 to 99,999), and 25.6% in large urban areas.

Circular Migrants' Educational Selectivity

In the ENADID/ENE series, educational attainment was collected only for migrants who are considered by the survey respondent to be "part of the household," whether or not they are physical present (or in the country) at the time of the survey. We include in our analyses of their educational selectivity any such person who has migrated to the U.S. in the last five years. This enables us to include among our emigrants substantial numbers of individuals who are currently living in, or are "part of" the household. We describe these individuals as "circular migrants." In the years 1992, 1997, and 2002, this identification in the ENADID/ENE of circular migrants was further restricted to those who migrated “for work or to look for work,” whereas in 2009 it included all those who “left to live in the U.S.” but who were currently living in, or were still part of, the household. We present in Figures 2(a) to 2(d) analyses of these four years. We omit 2006 due to educational attainment not being identified for any migrants.

Circular migrants are more likely to be household head or spouse and more evenly distributed across the three age groups than are the mostly-younger group of all emigrants, but are similar in their gender composition (more than 80% male) and in their place-size distribution (see Appendix Table A1.2). Even though circular migrants are only a subset of all migrants, they allow for a first look at the selectivity of Mexican migrants to the US by educational attainment. We compare the sample-weighted educational distribution of ENADID/ENE circular migrants to the education distribution of the sample-weighted ENADID/ENE resident population after first reweighting the resident population to the emigrant age distribution, as given by the three age-groups of Appendix Table A1.2: ages 18-24, 25-34, and 35-54. In demographic terminology (e.g., Smith 1992), we age-standardize the resident population to the age-distribution of the emigrant (circular migrant) population. This produces a “matching estimator” (e.g., Morgan and Harding 2006) in which emigrants are the “treatment” group and residents are the “control” group. The effect of reweighting the resident population to circular migrants’ slightly younger age distribution is to generate a more educated comparison group, due to the younger ages of migrants and educational progress over time.

[FIGURES 2(A) TO 2(D) ABOUT HERE]

Given the disproportionately large share of circular migrants from rural and small-urban Mexico throughout the 1990s and 2000s, where the population’s educational attainment is much lower, it is unsurprising that we find that circular migrants’ educational selectivity relative to all Mexican residents of labor-force age has been consistently negative. The educational attainment distribution of circular migrants is seen to be lower than that of 18 to 54 year old residents in every year. In particular, the percentages of circular migrants with no more than an elementary school education were in 1997, 2002, and 2009 around 14 percentage points higher than the percentages of the age-standardized resident population with no more than an elementary school education, and 5 percentage points higher in 1992. The percentages of circular migrants who had continued their schooling past lower secondary school were 8 and 12 percentage points lower than for all 18 to 54 year old residents in the 1992 and 1997 years, and as much as 18 and 21 percentage points lower than for all 18 to 54 year old residents in the 2002 and 2009 years. Thus although the educational attainment of circular migrants improved over time, it did not keep pace with improvements in the educational distribution of all Mexican residents. Circular migrants became increasing more negatively selected on educational attainment across the four time points from 1992 to 2009, mirroring findings on returning migrants from the 1990-2010 Mexican Censuses (Campos-Vasquez and Lara 2012).

Educational Selectivity of Male Mexico-U.S. Land-Border Emigrants, 1993-2004

As we noted, the ENADID/ENE series of circular migrants just presented are only a subset of all migrants. Unlike in the 2000s, the 1990s unfortunately offer few opportunities to use nationally-representative Mexican data sources to estimate emigrant educational selectivity. For this purpose, we turn to a probability sample survey of land border crossers, the Mexican Survey of Migration at the North Border (EMIF-N, CONAPO 2008). The EMIF-N is a place-time probability sample survey of all adults (age 15 and above) intending to migrate to the U.S., and is oriented towards capturing working-age migrants and migrants whose purpose of migration was or is for work (see Appendix 1). The EMIF has begun to enjoy some exposure in studies in the international scholarly literature on migrant remittances (Amuedo-Dorantes and Poza 2006) and wages (Brownell 2010), and more recently in the Pew Hispanic Center's analyses of Mexican migration flows (Passel et al 2012). The EMIF was collected in nine "waves" each of a year's duration between 1993/94 and 2003/04, with only 1995/96 and 1997/98 not covered (the year 1996/97 is covered). The EMIF switched to calendar year, continuous collection from 2005, but we limit our analyses to EMIF data collected up to and including the 2003/04 survey.

We define as migrants in the EMIF all those who intended to migrate to the U.S. within the next 30 days and to stay in the U.S. for at least three months. The three months cutoff conforms to the United Nations (1998) recommended definition of a short-term migrant (12 months is their minimum threshold for "long-term migrants"). Consistent also with the UN recommendations, we exclude those border crossers whose reason for crossing falls under a "visiting" category. The intention to migrate within the next 30 days is the EMIF's screener for answering the migration questionnaire. An additional screener is that the individual must not be born in the United States. We include only those born in Mexico. Migration of those that enter and leave the U.S. by airplane or ship without stopping in Mexican cities in the U.S.-Mexico border is not covered by the EMIF. Neither is the migration of individuals that live in the border localities (around 3% of all emigrants in the 1997 ENADID, Rendall et al 2009). Rendall et al (2009) compared the EMIF to the 1997 ENADID and found that the EMIF under-represented younger working-age migrants (ages 15-19) and female migrants, but represented well the geographical distribution of migrants' origins and matched closely the educational distribution of the ENADID's circular migrants. Because of its underrepresentation of female migrants, resulting also in low sample numbers of this group, we confined our EMIF analyses to male migrants only.

Crossing without inspection at land borders is the main opportunity for unauthorized emigration to the U.S. (overstaying a valid tourist or other short-term visa being the other). As we show in the analyses immediately below, land border crossings are also an important source of authorized emigration to the U.S. The EMIF therefore offers an opportunity to estimate the educational attainment distribution from a large, approximately nationally-representative sample of all Mexico-U.S. emigrants. Almost 11,000 migration events were obtained for our three birth cohorts as defined below. Another notable advantage of the EMIF is that these migrants are not limited in the way that migrants in Mexican household surveys are: In the EMIF there is no reliance on a household member being left behind in the Mexican residence for the migration event to be observed in the survey. The EMIF data unfortunately distinguish place size only between rural (< 2,500 population) and urban (2,500+ population). However, the larger migrant sample sizes achieved with the EMIF than with household surveys such as the ENADID allow us to conduct separate analyses into the educational selectivity of rural and urban migrants in addition to overall educational selectivity.

An analytical problem unique to the EMIF is that it does not include a comparison group of all residents. We turn instead to a method of estimation of the educational selectivity of EMIF emigrants using educational attainment by birth cohort. We divide the EMIF emigrants into three birth cohorts whose educational attainment we are able to estimate respectively from Mexico's 1990 and 2000 Censuses and 1995 mid-decade micro-census ('Conteo'). These three birth cohorts are: (1) the 1969-73 birth cohort, who were 17-21 year olds in 1990; (2) the 1974-78 birth cohort, who were 17-21 year olds in 1995; and (3) the 1979-83 birth cohort, who were 17-21 year olds in 2000. Our preliminary analyses the of the 1990, 1995, and 2000 Census and Conteo data indicated that a significant number of 17 year olds at Census date had not completed a first year of upper secondary school, we represented each of these five-year educational attainment distributions by that for 18 to 20 year olds (the middle three cohort years) at the 1990, 1995, and 2000 census or micro-census.

A problem for comparing educational selectivity of emigrants across our three birth cohorts is that emigration is limited to increasingly younger ages across birth cohorts. For the most recent, 1979-83 birth cohort, in particular, the oldest observed age at migration was 25. Because educational attainment is lower among the youngest (teenage) migrants, we need to control for age at migration when comparing the three birth cohorts. We do this by first estimating a multinomial logit model of education level of the migrant, in which age at first migration is a predictor of educational attainment of the migrant as at the current intended migration event. We define three age groups, age 16-20, age 21-24, and age 25-34, as regressors in this model. We then apply the age distribution of the middle, 1974-78 birth cohort to the predicted probabilities of each of the 5 education categories. Our results are then interpreted as the educational selectivity of migrants aged 21 to 24 for all three birth cohorts. Our main migrant selectivity findings from the EMIF, however, hold irrespective of whether we control for differences in age at migration between cohorts.

[TABLE 2 ABOUT HERE]

We present in Table 2 the results of our analyses of educational selectivity of EMIF-estimated male emigration flows compared to their respective birth-cohort educational-attainment distributions at ages 18 to 20. Mirroring the findings from the ENADID/ENE circular migrant series, an overall negative educational selectivity of emigrants is again seen (see “All Mexico” panel). In all three birth cohorts, the fraction of emigrants that had at least completed lower secondary school was approximately 10 percentage points lower than for the fraction of the full cohort that completed lower secondary school. For example, 55.0% of migrants of the 1969-73 birth cohort had completed lower secondary school, compared with 64.4% of the birth cohort when observed in the 1990 Census at age 18 to 20. Negative selection of emigrants was large in the category of those who had completed elementary school only, or had started but not completed lower secondary school. These two groups of educational attainment levels account respectively for 30.4% and 14.8% of emigrants from the 1974-78 birth cohort but only 20.5% and 6.1% of the entire 1974-78 birth cohort. Also like the household survey analyses, there is some evidence of increase in the extent of negative emigrant selection across cohorts when contrasting migrants and residents at our highest educational attainment category. Although cohort educational attainment (the fraction with at least some upper secondary education) increased from 25.9% to 35.2% between 1990 and 2000, the fraction of migrants with this educational level increased only from 10.5% to 12.8%. Again, migrants' education increases did not keep up with the education increase of the overall Mexican population. Unlike the household survey analyses of circular migrants, however, the percentages of border-survey emigrants from the lowest educational category, that of less than an elementary-school education, were similar to the shares in the entire cohort: declining from 19.6% of the 1969-73 migrant cohort to 12.3% of the 1979-83 migrant cohort, compared to 17.7% and 12.8% of the full 1969-73 and 1979-83 birth cohorts. The educational categories that were overrepresented among migrants were instead those who completed primary school (and no more) and those who began but did not complete lower secondary school. Together these categories accounted for between 43 and 45 percent of all migrants from the three birth cohorts, but only for 22 to 27 percent of the entire birth cohorts.

When analyzing rural and urban migrants separately (lower two panels of Table 2), the result that stands out is that the educational attainment distributions of rural and urban *migrants* are much more similar to each other than are the educational attainment distributions of rural and urban *residents* (that is, from the entire birth cohorts from which the migrants are drawn). Rural migrants and urban migrants who completed primary school and no more or who began but did not complete lower secondary school are both overrepresented relative to the fraction of the cohort with these education levels observed respectively in rural and urban Mexico when aged between 18 and 20. In rural Mexico these two educational categories account for between 45 and 49 percent of migrants, and in urban Mexico for between 41 and 43 percent of migrants. The same two educational categories, however, account for 35 to 38 percent of rural residents but only 19 to 24 percent of urban residents of the same birth cohorts. Rural migrants are more likely to have less than a primary school education than are urban migrants, and urban migrants are more likely to have completed at least some upper secondary school than are rural migrants, but the differences are only between 5 and 10 percentage points in each case. In contrast, the rural-urban differences in these lowest and highest educational attainment groups are between 20 and 30 percentage points for the entire cohorts who were resident in rural Mexico when aged 18-20.

Educational Selectivity of 2002-2005 Migrants from the MxFLS and 2006-2010 Migrants from the ENOE Household Surveys

For the 2000s decade, we were able to compare the educational attainment of migrants and all residents from two nationally-representative Mexican household survey sources: in the first part of the decade from the 2002 and 2005 waves of the Mexican Family Life Survey (MxFLS), and in the second part of the decade from the 2006 to 2010 quarters of the National Survey of Occupation and Employment (ENOE).

The MxFLS is a panel survey in which educational attainment and other socio-demographic characteristics are observed in 2002 and the migration event is observed as a change of residence from living in Mexico in 2002 to living in the U.S. in 2005. To approximate the age of migration in the retrospective ENADID/ENE data series, we define age one year before the 2005 wave (in 2004), and select those who were aged 18 to 54 in 2004. Educational attainment is defined, however, at its level when observed in the 2002 wave, when the individual was aged 16 to 52. Unfortunately the definitions of small and medium-sized urban areas differ between the MxFLS, which uses 2,500 to 14,999 as small urban, and our other data sources, which use 2,500 to 19,999. We also found that as many as 36% of migrants in the MxFLS were female (see Appendix Table A1.3). The greater proportions female in the MxFLS may be due to the longer period across which migration is defined, as female emigrants are much less likely to return quickly to Mexico than are male emigrants (Reyes 2001, 2004). Another factor may be the ENE, ENOE, and ENADID's omitting female emigrants in the case that the entire household (or its remaining members) emigrated. Notably similar between the MxFLS and the 2002 ENE (see again Table 1), however, are the MxFLS' place-size distribution of residents, and also of migrants (see Figure 3). Emigrants in the MxFLS are again disproportionately drawn from rural Mexico. At 41.2% of all emigrants, rural emigrants are exactly twice their proportion of all residents (21.1%). The 25.8% of emigrants who departed from large urban areas of Mexico, meanwhile, is only half of these large urban areas' 51.5% share of all labor-force-age residents.

[FIGURE 3 ABOUT HERE]

As we did for the circular migrants of the ENADID/ENE, we control for the predominance of younger emigrants in the MxFLS by comparing the sample-weighted educational distribution of MxFLS emigrants against the education distribution of the sample-weighted MxFLS resident population, again after first reweighting the resident population to the emigrant age distribution (see *Circular Migrants' Educational Selection* section above). Against this reweighted resident-population comparison group, the emigrants from the MxFLS 2002 to 2005 period are seen to be again strongly negatively selected on educational attainment. The differences between emigrants' and residents' proportions across our five educational categories mirror those for ENE 2002 circular migrants and residents (see again Figure 2(c)). The MxFLS' 17.5% of emigrants in the highest education category of "progressed to upper secondary school" is 17.6

percentage points lower than the reweighted MxFLS residents' percentage of 35.0%. Compared to the 40.3% of emigrants with no more than an elementary school education, only 29.4% of the reweighted resident population had no more than an elementary school education. Finally, compared to the 42.2% of emigrants with some or complete lower secondary schooling, 35.6% of the reweighted resident population was in this group. Thus emigrants were disproportionately drawn from the lowest and middle education groups in the Mexican educational attainment distribution. Compared to the U.S. educational attainment distribution, of course, the contrast is far greater: 82.5% of Mexican emigrants to the U.S. completed no more than the nominal equivalent of ninth grade, whereas approaching 90% of U.S. 25 to 34 year olds in 2005 had at least an upper secondary (high school graduate) education (OECD 2007).

[FIGURE 4 ABOUT HERE]

We constructed an analogous set of estimates for the quarterly migrants from the 2006 to 2010 National Survey of Occupation and Employment (ENOE). The National Survey of Employment and Occupation (ENOE) is a quarterly survey similar to the U.S. Current Population Survey (INEGI 2005). Residences are surveyed and the current household is interviewed in five consecutive quarters. The ENOE's quarterly panel design permits observation of migrants' education before emigration. Estimates of educational selectivity from the ENOE are shown in Figure 4. Against the reweighted resident-population comparison group, the emigrants from the 2006 to 2010 period are seen to be again strongly negatively selected on educational attainment, though somewhat less so than in the MxFLS. The 30.0% of emigrants in the highest education category of "progressed to upper secondary school" is 13.7 percentage points lower than the reweighted ENOE residents' percentage of 43.7%. Compared to the 40.3% of emigrants with no more than an elementary school education, only 29.4% of the reweighted resident population had no more than an elementary school education.

Finally, compared to the 37.7% of emigrants with some or complete lower secondary schooling, 27.7% of the reweighted resident population was in this group. Thus emigrants were disproportionately drawn from the lowest education groups in the Mexican educational attainment distribution in all four data sources we have examined here, spanning 1987-1992 through 2006-2010.

Assessing the Educational Selectivity of the 1991/92 through 2008/09 ENADID/ENE Migrant Series by Imputing Migrant Education

The above estimates, coming as they do from substantially different probability sampling and observational plans and with substantially different migrant definitions, provide an excellent check on the robustness of estimates of migrant educational selectivity. They do not, however, provide a consistent time series of conventionally-defined migrants over the 1990s and 2000s. Moreover, their estimates combine geographical and behavioral selectivity, whereas a major goal of the present study is to understand how much overall migrant selectivity is driven by a particular form of geographical selectivity, that of selectivity by place-size. To achieve both of these goals, we use an imputation strategy to transform the series of all ENADID/ENE annual migrants (of Table 1) into one with indirectly-estimated (imputed) educational attainment distributions. We combine the ENADID/ENE series of 1992 to 2009 emigrants shown in Table 1 using a logit that concatenates migrant selectivity parameters estimated from ENOE 2006 to 2010 data with other parameters predicting residents and migrants' education, as estimated from the ENADID/ENE resident population of each year in the series of 1992 through 2009. Details of the method, including sensitivity analyses using alternately MxFLS 2002 to 2005 migrant-selectivity parameters, are presented in Appendix 2.

[TABLE 3 ABOUT HERE]

The values of these migrant-selectivity parameters for the ENOE quarterly migrants observed between 2006 and 2010, and alternately for the MxFLS 2002 to 2005 migrants, are presented in Table 3 (and see Appendix Table A2.1 for the full equations). We estimate a regression specification in which being a migrant is interacted with being female. The migrant main effect coefficients therefore describe the likelihood of being in each of the lower four education categories among *male* migrants. Given the different ways that migrants are defined and identified between the two surveys and the different periods, of close to peak migration between 2002 and 2005 versus rapidly declining migration between 2006 and 2010, the similarity between the sets of migration selection parameters is striking. Compared to the reference outcome category of at least some upper secondary education, male migrants are much more likely to have any *other* educational attainment, controlling for their age, relationship to head, *and* their place size. That is, even within our four place-size groups, male migrants are strongly negatively selected. This is not generally true of female migrants, however, as seen in the ‘Migrant*female’ coefficients that are of approximately equal magnitudes to the migrant main-effect coefficients, but with a negative sign. This approximate canceling out of the migrant main effect coefficients implies a more or less neutral ‘behavioral’ selectivity with respect to education among female migrants.

Given the much larger migrant sample sizes in the ENOE than in the MxFLS (4,925 versus 554), and the correspondingly much larger non-migrant sample sizes too in the ENOE, the standard errors about the migrant selection coefficients in Table 3 are only a third to a fourth as large as in the MxFLS. This is a major reason for our preferring the ENOE over the MxFLS coefficients for the imputations presented here. A second reason is that the sampling designs and the definitions of migrants in the ENOE are closer to those in the ENADID/ENE series. Because the magnitudes of the estimated educational selectivity of migrants are of somewhat less negative (smaller absolute differences from the reference ‘at least some upper secondary’ category) in the ENOE than in the MxFLS, moreover, our imputed educational attainment results are conservative with respect to our study’s main conclusion that Mexican migrants to the U.S. are strongly negatively selected on education.

[TABLE 4 ABOUT HERE]

Our ENADID/ENE series migrant education imputation procedure is conducted separately by gender, due to the emigrant education selection parameters being more negative for male emigrants than for female emigrants. We present results separately by gender and for both genders combined (see Table 4). To combine the genders, we weight the predicted male and female emigrants’ educational attainment distributions by the observed ENADID/ENE proportions of male and female migrants (from Table 1). The resident educational attainment distributions are again reweighted to the respective migrant age distributions. We interpret the results as estimates of how overall migrant educational selectivity would have changed in the absence of change in behavioral selectivity. We see that migrants’ predicted educational attainment increased greatly between 1991/92 and 2008/09, but that this increase was less than the increase in overall educational attainment. Because we are holding behavioral selectivity constant (that is, constant by age, sex, relationship to household head, and place size), we interpret the lesser increase in migrants’ than residents’ educational attainment as having been driven by the moderate increases in the relative fractions of migrants originating from rural and small-urban Mexico over the 1990s and 2000s (see again Table 1). Across the five time periods, 1991/92 through 2008/09, migrants who completed primary school but did not progress further are the most *over*-represented group relative to the resident population age 18 to 54, and migrants who completed any upper secondary education the most *under*-represented group.

Emigrants with any schooling greater than the U.S. equivalent of ninth grade (that is, any Mexican upper secondary education) again are seen to constitute a remarkably low fraction of all emigrants, and emigrants with no more than a U.S.-equivalent of elementary schooling (Mexican primary education) a remarkably high fraction. In the 1991/92 and 1996/97 years, only 9.6% and 6.9% respectively of all emigrants are estimated to have had any years of upper secondary schooling in Mexico, and 19.2%, 20.2%, and 24.4% respectively of all emigrants in the 2001/02, 2005/06, and 2008/09 years. Again, these increases in migrant education have failed to keep pace with the overall increase in Mexicans' going on to this level of education, which rose from 23.0% in 1992 to 43.8% in 2009 (see 'residents' column). Thus migrants' percentage-point difference from residents' rose from 13.5 for 1991/92 migrants to 19.4 for 2008/09 migrants. At the other end of the education distribution, our predicted distributions of emigrants' educational attainment exhibit large fractions of emigrants with no more than elementary-school education: gradually declining from 63.9% of 1991/92 emigrants to 41.4% of 2008/09 emigrants. At the same time, the fractions of similar-age Mexican residents with no more than elementary-school education declined similarly in percentage point terms, from 49.3% in 1992 to 29.0% in 2009.

In these imputed distributions, male emigrants are more negatively selected than female emigrants. The fraction of male emigrants with any years of upper secondary schooling is consistently between 18 and 24 percentage points lower than the fraction with any years of upper secondary schooling among similar-age male Mexican residents. In contrast, the fraction of female emigrants with any years of upper secondary schooling is between 9 and 15 percentage points lower than that for similar-age female Mexican residents. However, the modal educational category is completed primary education for both male and female migrants through the period 1991/92 through 2005/06, with the minor exception of slightly more 1991/92 male migrants who have less than a primary education. Only in 2008/09 does the modal migrant educational category shift to 'completed lower secondary school,' and does so for both male and female migrants. The educational attainment distributions of male and female migrants are therefore not as different from each other as the selectivity results suggest. Instead, the lower overall educational attainment of the female Mexican resident population relative to the male Mexican resident population is a critical additional source of female migrants' less negatively selected educational distributions. This result mirrors somewhat the rural versus urban breakdown of migrant education seen above for the border-survey EMIF, in which rural and urban migrants' educational distributions were much more similar than were the rural and urban resident population distributions.

DISCUSSION

Previous studies of Mexican immigrant educational selectivity have generated mixed conclusions. Findings of intermediate-to-positive selectivity from studies using U.S. data sources (Feliciano 2005, 2008; Chiquiar and Hanson 2005) contrast with findings of negative selectivity from studies using nationally-representative Mexican data sources (Ibarraran and Lubotsky 2007; Fernandez-Huertas Moraga 2011; Ambrosini and Peri 2012; but see also Kaestner and Malamud 2013). In the present study, we focused on the sources of overall educational selectivity in the socio-geographic origins of Mexico's migrants to the U.S. We used a patchwork of Mexican data sources, each one broadly nationally-representative, though each one different in its definition and coverage of migrants. Analysis of each source, however, resulted in a common finding of strongly negative educational selectivity coincident with a large over-representation of rural and small-urban places of migrant origin. Our findings thus support and extend the findings of Ibarraran and Lubotsky (2007) and Fernandez-Huertas Moraga (2011), and counter the findings of Feliciano (2005, 2008) and Chiquiar and Hanson (2005). The primary extensions of our study are to its covering almost a 20 year period and to its including data sources in both decades that do not depend on having a household member still present in Mexico to report the move. Additionally, our breaking down “urban” Mexico into small-, medium-, and large-sized places also proved insightful, as small urban areas (population < 20,000) contribute disproportionately large numbers of migrants and have low overall educational attainment, while large urban areas (population > 100,000) contribute disproportionately small numbers of migrants and have the highest overall educational attainment.

Our findings of two decades of negative selection are thus the result of two countervailing socio-geographic features of migrant selection that we found to hold strongly throughout the 1990s and 2000s. First and foremost, migrants have consistently been disproportionately drawn from rural and small-urban areas in Mexico. Far from this selection by place size abating, as found in analyses of data sources not designed to be nationally representative of Mexico (e.g., Marcelli and Cornelius 2001; Garip 2012), we found instead evidence for increases in the shares of rural and small-urban-area migrants relative to the distribution of the Mexican population by place size across the two decades, albeit relatively small. While there was some redistribution of the Mexican working-age population from rural to, in particular, medium-sized urban areas, there was no corresponding change in the distribution of emigrants’ place sizes of origin. Consistently around 45% of all emigrants originated from rural Mexico, and this was upwards of twice rural Mexico’s share of all working-age residents. Together, migrants from rural and small-urban areas (population < 20,000) accounted for consistently two thirds of all migrants to the U.S. in the 1990s and 2000s, but only from one third to two fifths of Mexico’s resident working-age population. Because of the ongoing steep educational attainment gradient by place size that we also documented, we argue that the single most important insight into understanding the educational selectivity of migrants from Mexico to the U.S. is therefore found in the disproportionately large share of migrants that come from rural and smaller urban areas in Mexico. In the analyses we conducted of migrants in rural and urban places of origin, moreover, we found much more similar educational distributions between rural and urban migrants than between the rural and urban populations they were drawn from. This is likely to be due to the smaller urban areas having simultaneously the highest rates of emigration and the lowest educational attainments, as shown by Ibarraran and Lubotsky (2007) for 1995 to 2000 emigration from Mexican Census households.

A second factor counting against the plausibility of overall positive educational selectivity is that men have consistently accounted for the majority of migrants. We found that they represent upwards of four fifths of migrants throughout these two decades when emigration is reported by household members remaining in Mexico, though only two thirds of migrants when the migrants themselves are followed up after a three-year period. This difference is consistent with a much higher rate of return migration among men than women (Reyes 2001, 2004). A downward bias in the estimation of female migrants when the migration is reported by a remaining household member (Hill and Wong 2005), however, may also contribute to the very low female proportions of migrants estimated from our main data sources. Studies of Mexican migrant educational selectivity have found female migrants to be more positively selected than male migrants (Kana'iaupu 2000; Feliciano 2008). Our own analyses of migrant selectivity presented here, both over a three-year period from 2002-2005 in the Mexican Family Life Survey (MxFLS), and over three-month periods from the 2005-2010 Mexican National Survey of Employment and Occupation (ENOE), indicate relatively strong negative 'behavioral' educational selectivity for men (that is, after controlling for place size, age, and relationship to head), and more or less neutral 'behavioral' selectivity for women. Against our chosen reference category of 'any upper secondary education' (equivalent to 10 or more years of schooling), we estimated for men an increasing likelihood of migration with increasing distance from this highest education category (that is with lower education). No such clear pattern was seen, however, for women. In our analyses that distinguished male and female migrants, we noted that female migrants' educational attainments were somewhat higher than male migrants' educational attainments, but less than might otherwise be expected given the negative behavioral selectivity of men but not women. For the 1990s, though no longer in the 2000s, this is due to the lower overall educational levels of women than men in Mexico, as shown also in our analyses. Thus any underestimation of overall educational attainments of Mexican migrants to the U.S. that is due to our underestimating the share of women in migrant flows, coupled with more positive educational selectivity among women, will be at least partly offset by this gender disparity in educational attainment.

Our findings are important because they indicate that the overall lower levels of educational attainment in Mexico than in the U.S. are only part of the reason for the low overall educational attainment of Mexican migrants to the U.S (e.g., Borjas 1995); negative selection by education in who migrates is also important. In particular, we find a much lower probability that Mexicans with at least some upper secondary school education will migrate to the U.S. compared to the probability for less educated Mexicans. Consequently, the much lower proportion of the high school graduates (translated to U.S.-equivalent years of education) in Mexico than in the U.S. explains no more than half of the low proportion of more educated Mexicans in migrant streams.

Given the preponderance of evidence for overall negative educational selectivity of Mexican emigrants to the U.S. over the 1990s and 2000s found in the present study, what are the most likely causal explanations? Although one prominent alternative economic theory is that higher relative earnings inequality in the sending country than in the receiving country will produce negative selected migrant flows (Borjas 1987), in few cases internationally has this been large enough to dominate differences in absolute returns to education in a higher-income destination country (Liebig and Sousa-Poza 2004; Grogger and Hanson 2011). Grogger and Hanson note, moreover, that the United States has one of the highest returns to education among high-income immigrant-receiving countries and accordingly receives a disproportionately large share of tertiary educated immigrants across OECD countries.

The most persuasive explanation to us is that immigration policy has offered few routes for legal migration to the U.S., coupled with a large pool of working-age migrants facing low wages in Mexico, much higher wages in the U.S., and relatively low costs of migrating to the U.S. We presented estimates that between 80 and 85% of Mexican migrants to the U.S. were undocumented in the early to mid 2000s, consistent with Passel and Cohn's (2008) indirect estimates with U.S. data and those of CONAPO (2012) from direct reports from migrants in the EMIF. The 1990s and late 2000s saw somewhat lower proportions of undocumented migrants (e.g., around 70% in 2008/09 from our analyses), though a majority of migrants were undocumented throughout the period of our study (Hanson 2006; CONAPO 2012). The restrictive U.S. immigration policy that has been in place throughout the 1990s and 2000s does not appear to have had the intended effect of deterring unauthorized migration overall (Hanson 2006; Massey and Pren 2012). It may, however, have had a disproportionate deterrent effect on higher-skill migrants relative to lower-skill migrants. This has been shown to be a theoretical possibility by Bellettini and Ceroni (2007) and Bianchi (2013). Empirically, undocumented status has been shown to result in lower wage returns to education (Rivera-Batiz 1999; Massey and Gelatt 2010), with Massey and Gelatt arguing additionally that wage-disadvantaging effects spill over to documented Mexican migrants. Further support for the characterization of U.S. immigration policy as disproportionately selecting more educated Mexicans out of migrant flows to the U.S. is found in ethnographic evidence from Kandel and Massey (2002) describing a sorting mechanism within Mexican communities in which Mexican youth view migration to the U.S. as an alternative to additional schooling, for which they see as having little value for the jobs they are likely to obtain in the U.S. Ambrosini and Peri (2012, p.148) similarly conclude that “The option of undocumented migration [is] only attractive for less educated…” and suggest changes to U.S. immigration policy that would target more as well as less educated individuals.

If immigration policy is indeed the primary explanation for the highly unusual phenomenon that we have documented here of negative educational selectivity among Mexican immigrants to the U.S. over these two decades, a final note is that this would not be completely without precedent. According to Bauer et al (2002), who provide evidence specifically on Portugal-Germany flows before Portugal’s entry to the European Union, policies aimed at importing low-skill labor in Germany and several other high-income European countries in the 1970s had the effect of producing overall negative selection of immigrants from neighboring lower-income countries in Southern Europe, Turkey, and Yugoslavia. Higher returns to low-skilled workers in the higher-income European country were claimed to be the key determinant of this phenomenon, again with supporting evidence from Portugal-Germany flows. Although these flows from Southern Europe, the Balkans, and Turkey were largely of legal migrants, a common characteristic of immigration policy between the formal programs to import low-skill labor to high-income European countries at that time and the informal migration of low-skill labor to the U.S. from Mexico in recent decades has been the lack of opportunities for high-skill migrants from the source country to realize returns to their higher education and skills in the destination country.

APPENDICES

APPENDIX 1: THE DATA SOURCES (ENADID, ENE, ENOE, EMIF, CENSUS/'CONTEO', AND MXFLS)

We describe in more detail in this appendix the data sources of our study. We also present tabulated data for these sources where they are needed to supplement the charts and abbreviated tables in the main text. The household surveys we analyzed in our paper are the 1992, 1997, 2006, and 2009 National Survey of Population Dynamics (ENADID) and the 2002 National Survey of Employment (ENE) Migration Module that is based on the ENADID's, the 2006-2010 National Survey of Employment and Occupation (ENOE), and the Mexican Family Life Survey (MxFLS). We analyze migrants also from a border survey, the Survey of Migration at the North Border (*Encuesta sobre Migración en la Frontera Norte de México*, or *EMIF*, CONAPO 2008). We use the EMIF in combination with microdata samples from the 1990 and 2000 Mexican Census (Minnesota Population Center 2006) and the 1995 mid-decade micro-census ('Conteo') (INEGI 2003b) to estimate the educational-attainment composition of the Mexican birth cohorts whose emigration is observed in the 1993 to 2004 EMIF data.

The 1992, 1997, 2006, and 2009 National Survey of Population Dynamics (ENADID) and 2002 Migration Module of the National Employment Survey (ENE)

The National Survey of Population Dynamics (ENADID) was conducted in 1992, 1997, 2006, and 2009 (INEGI 2003a), with migration information a major part of the survey. To fill the gap between the 1997 and 2006 ENADID surveys, in 2002 a migration module based on the 1997 ENADID was attached instead to the fourth quarter of the National Employment Survey (ENE, INEGI 2005). Our analyses are of men and women aged 18 to 54. We use this series both for analyzing the characteristics of the resident Mexican population, including its educational attainment by place size (see Appendix Table A1.1).

[APPENDIX TABLE A1.1 ABOUT HERE]

The 1992, 1997, 2002, 2006, and 2009 ENADID/ENE surveys include a section of the questionnaire on the migration in the last five years of anyone who had been a member of the household. We code from the questions on the year and month of the last emigration event the number of migrants in the year immediately preceding the survey. Educational attainment, however, is not collected for this full set of migrants. The 1992, 1997, 2002, and 2009 surveys allow for the coding of the educational attainment of 'circular migrants': those who were currently "part of the household" and who in the five calendar years before and including the survey year had "left for the U.S. for work or to look for work or to study" (1992, 1997, and 2002) or who had "left to live in the U.S." (2009). Whether the last move was a documented or undocumented migration event is also asked of this subset of all migrants in the 1997, 2002, and 2009 survey years. The educational distributions of these 'circular' migrants ages 18 to 54 compared to the educational distributions of all residents, standardized to the migrant age distribution, are shown in Appendix Table A1.2.

[APPENDIX TABLE A1.2 ABOUT HERE]

The major limitations of the ENADID are its infrequent periodicity, and that it captures the emigration only of individuals who have ongoing attachment to current Mexican households. As Wong Luna et al (2006, p.14) note, this may not represent the full population especially of female Mexican emigrants to the U.S. Missed are the emigration of individuals in single-person households, emigration of complete households, and emigration that occurs to individuals in households that dissolved between the migration event and the survey. Hill and Wong (2005) compare ENADID results with residual net migration estimates from the 1990 and 2000 censuses alternately of Mexico or the US. They find ratios of male to female emigrants in ENADID that are more than double those of their residual estimates and conclude that the

ENADID underestimates female emigration due to the greater likelihood of women's settling in the U.S. with their family, and therefore being lost to the ENADID's Mexican household sampling frame. Comparisons of sex ratios in the ENADID gross emigration flows to those in Census-to-Census net emigration flows, however, are confounded by the much lower return migration rates of female than male migrants (Reyes 2001, 2004) which inflate the Census ratios of migrant women to migrant men.

The 2006-2010 National Survey of Employment and Occupation (ENOE) and the 2002 to 2005 Mexican Family Life Survey (MxFLS)

The National Survey of Employment and Occupation (ENOE) is a quarterly survey similar to the U.S. Current Population Survey (INEGI 2005), used recently to study return migration to Mexico (Rendall, Brownell, and Kups 2011). Residences are surveyed and the current household is interviewed in five consecutive quarters. The ENOE's quarterly panel design permits observation of migrants' education before emigration. The Mexican Family Life Survey (MxFLS) is a nationally representative longitudinal survey of Mexican households (Rubalcava and Teruel 2007). The survey is intended to collect information on socioeconomic, demographic and health indicators of the Mexican population. The first two waves of data, used here, were collected in 2002 and 2005. Although the sample size is small relative to the ENADID and ENOE household surveys, the MxFLS oversampled migrant-sending regions. In both the ENOE AND MxFLS, educational attainment is available for all individuals, including those who became migrants by the next quarter (ENOE) or next wave (MxFLS). We present socio-demographic distributions, including educational attainment, of both migrants and residents in Appendix Table A1.3.

[APPENDIX TABLE A1.3 ABOUT HERE]

The Survey of Migration at the North Border (EMIF) and 1990 and 2000 Mexican Census and 1995 'Conteo'

We identify cohort trends in Mexican migrants' educational composition relative to that of residents through observation of the same birth cohorts at different ages across the multiple periods of the nine approximately-annual surveys from 1993/94 through 2003/04 in the Survey of Migration at the North Border (*Encuesta sobre Migración en la Frontera Norte de México*, or *EMIF*, CONAPO 2008). The EMIF is oriented towards working-age migrants and migrants whose purpose of migration was or is for work. The EMIF has so far been used in studies published in Mexico (e.g., Anguiano 2003; Mendoza 2004; Alarcón et al 2008), and has begun to enjoy some exposure in studies in the international scholarly literature on migrant remittances (Amuedo-Dorantes and Poza 2006) and wages (Brownell 2010).

The EMIF has been collected in "waves" each of a year's duration at approximately annual intervals since 1993/94. Data from the first nine waves were available when we constructed the cross-wave-comparable dataset for our study. The first wave of this survey took place between March 28th 1993 and March 27th 1994, the second from December 14th 1994 to December 13th 1995, the third from July 11th 1996 to July 10th 1997, the fourth from July 11th 1998 to July 10th 1999, the fifth form July 11 1999 to July 10th 2000, the sixth from July 11th, 2000 to July 10th 2001, the seventh from July 11th 2001 to July 10th 2002, the eighth from July 11th, 2002 to July 10th, 2003, and the ninth is from July 11th, 2003 to June 30th, 2004. The EMIF switched to calendar year, continuous collection from 2005, but we limit our analyses to EMIF data collected up to and including the 2003/04 survey.

The survey design and sampling method of the EMIF is not based on households but instead on travelers, authorized and unauthorized, at or near the main land border crossing points between Mexico and the U.S. The methodology of the EMIF has been developed to collect probability samples with which to estimate the periodical, seasonal, or cyclical journeys of migrants both to and from the United States (CONAPO 2008). The principle of the sampling plan is based on probabilistic sampling of times in places of arrival in, or departure from, each of eight border cities. The first (1993/94) wave of the EMIF was of 23 border localities. Of these 23, eight of them accounted for 94% of all migrants in the EMIF. From the second (1994 to 1995) wave onwards, therefore, only these eight major migration cities were included: Tijuana and Mexicali in the State of Baja California, Nogales in the State of Sonora, Ciudad Juárez in the State of Chihuahua, Piedras Negras in the State of Coahuila, and Nuevo Laredo, Reynosa, and Matamoros in the State of Tamaulipas. The EMIF uses a multistage sampling design: in the first stage geographic units are selected (regions, cities, zones, and sampling points); the second stage involves selecting temporal sampling units: every quarter, day of the week, and hour; finally, at the selected place and time, people answer a screening instrument, from which migratory flows are identified and the respective questionnaire is applied. Probability factors are assigned at every stage, proportional to the flows of people passing through the geographic unit at the selected time.

Although this survey sample design is a departure from the usual, household-based sample designs, it is similar to that for the main survey used for estimating migration flows to and from the United Kingdom, the International Passenger Survey (IPS, Office for National Statistics 2008). The sets of places sampled in the EMIF, however, is broader in some ways and more limited in others. Whereas the IPS samples only ports (air, sea, and bus/train), thereby restricting the sample essentially to authorized crossing points and authorized migrants, the EMIF additionally samples transit points for people arriving in the border towns and cities. This allows for the final EMIF sample to include both authorized and unauthorized international migrants.

The EMIF filters in “migrants” from among all cross-border travelers based on a combination of their stated purpose for crossing the border and which country they are currently resident. Migration-qualifying reasons are work or looking for work (‘trabajar’ or ‘buscar trabajar’), reuniting with family or friends (‘reunirse con familiares/amigos’), study (‘estudiar’), or other (‘otro’). Excluded are those who state their main reason for crossing the border to be a visit (‘paseo’), business (‘negocios’) or shopping (‘compras’). The EMIF excludes all individuals born in the U.S., and we additionally exclude from our analyses those migrants born in countries other than Mexico.

The EMIF does not measure migration events, but instead *intentions* to migrate. Specifically, we identify as migrants in the present study those individuals who respond that they intend to cross into the U.S. within the next 30 days after the survey. To further restrict “migrants” by intended length of time in the U.S., we use the three months minimum threshold established by the United Nations (1998) for their recommended definition of short-term international migrants (12 months is their minimum threshold for “long-term migrants”). Consistent also with those recommendations, we exclude those border crossers whose reason for crossing falls under a “visiting” category.

The EMIF’s strengths are its probabilistic sampling of migrants, its coverage of both authorized and unauthorized migrants, its large migrant sample sizes, and its almost annual periodicity. Migration of those that enter and leave the U.S. by airplane or ship without stopping in Mexican cities in the U.S.-Mexico border, however, is not covered by the EMIF. Neither is the migration of individuals that live in the border localities (around 3% of all emigrants in the 1997 ENADID, Rendall et al 2009). A further concern is the EMIF’s apparent underrepresentation of female and younger working-age migrants (Rendall et al 2009), and possible biases associated with this underrepresentation.

The EMIF emigrant sample of the present study and its comparison to overall cohort education

Consistent with the aims of the present study, we analyze only Mexican-born migrants in the EMIF. Because of the low EMIF sample numbers of female migrants, and following Rendall et al's (2009) finding of large underestimation of female migration in the EMIF, we analyze only male migrants. We focus on migrants aged 18 to 34 years old so that we are able to follow cohorts from their educational attainment observed between 1990 and 2000 to their migration between 1993 and 2004. We include both first-time migrants (who report that they have not previously been to the U.S. for work or to look for work) and repeat migrants. We use age at first migration, which may or may not be the current migration, to control for differences in education by age at migration across the birth cohorts over the 1993-2004 period of our EMIF samples.

Because the border survey EMIF includes only migrants and not a comparison set of non-migrants, we use the 1990 and 2000 Mexican Censuses and the 1995 mid-decade Mexican micro-census ('Conteo', INEGI 2003b; Minnesota Population Center 2006) to estimate the educational and socio-demographic distributions of those at risk of labor-force-age migration. We restrict our EMIF migrants accordingly to three five-year birth cohorts, whose migration is observed between 1993 and 2004 at ages 18-34. We obtained distributions education of the 1969-73, 1974-78, and 1979-83 birth cohorts observed at ages 18-20 in the years 1990, 1995, and 2000 from the Mexican public-use sample data compiled in the IPUMS international (IPUMSi) collection (Minnesota Population Center 2006). We used the original Mexican Census and 'Conteo' variables provided by the IPUMSi and not the harmonized version. Nevertheless, the exact matching of educational classifications between the EMIF and Census/Conteo was difficult to achieve for all categories of schooling type in Mexico. Therefore in coding the same five categories as in the household survey estimates above, we include only years in the ‘general’ school tracks, not in ‘technical’ schools. These ‘general’ schools are the ‘primaria’ for the elementary school level, the ‘secundaria’ for the lower secondary school level, and the ‘preparatoria’ for the upper secondary school level. We are able to code these categories close to equivalently between the EMIF and the Census/Conteo data sources. We present socio-demographic distributions, including educational attainment, of EMIF migrants and Census/’Conteo’ residents in Appendix Table A1.4.

[APPENDIX TABLE A1.4 ABOUT HERE]

An additional complication unique to the EMIF analyses of educational selectivity is that rural-to-urban migration that may have preceded Mexico-U.S. emigration. Some emigrants to the U.S. from an urban Mexico place of last residence will have received their schooling in rural Mexico. We are unable to identify in the EMIF whether the rural-urban migration preceded or followed completion of schooling. This is a potential problem for estimating educational selectivity differentially for rural and urban migrants, although it will not bias estimates of overall educational selectivity. The education of EMIF urban emigrants may in part be more similar to that of rural migrants (see main text and table) because some urban migrants obtained their education in rural Mexico.

APPENDIX 2: PREDICTING EDUCATIONAL ATTAINMENT FOR THE ANNUAL ALL-MIGRANT SERIES

We use the ENOE, and alternately the MxFLS, as an auxiliary data source in the generation of predicted migrant educational distributions for the annual all-migrant ENADID/ENE series. This extends the method used by Ibarraran and Lubotsky (2007) to predict educational distributions of migrants reported in the 2000 Mexican Census. Those authors used the observed educational attainment of otherwise similar residents to predict the educational attainment distributions of migrants, whose educational attainment was unobserved. Ibarraran and Lubotsky estimated educational selectivity of migrants using 2000 Mexican Census data with a fine-grained level of observable demographic characteristics of both migrants and non-migrants, but with educational attainment observed only for non-migrants. They imputed exactly the same educational distribution to the migrants as to the non-migrants within their finely-drawn demographic "cells", and then aggregated both up to the national level of "migrant educational selectivity" of their study. Because they had place-size, age, and household composition at the county level for both migrants and migrants, and because educational attainment varies greatly by place size and these other individual, household, and community characteristics, they argued that they were able to estimate with reasonable accuracy the educational attainment of migrants without observing it directly. Their assumption was that within these fine-grained geographic and socio-demographic cells, any differences between the education of migrants and non-migrants would be very small and be dominated by cross-cell variation in educational attainment.

We agree with Ibarraran and Lubotsky that educational distributions of both residents and migrants vary greatly by demographic characteristics including age, gender, relationship to head, and place size, and therefore that locating where across these socio-demographic cells migrants are most commonly found will tell us much about the educational attainment of all migrants relative to all non-migrants. Accordingly, we use information on the educational attainment of non-migrants within age, gender, relationship to head, and place-size cells in our prediction of the educational attainment of the migrants drawn from those same cells. We relax the assumption, however, that migrants and non-migrants are drawn randomly from all individuals with the same observable socio-demographic characteristics. In order to do this, we bring in an auxiliary data source from which a within-cell “migrant premium” may be estimated.

Our estimation of the migrants’ educational attainment distribution within cells is therefore a combination of non-migrants’ educational attainment distributions within cells and a migrant premium added to that distribution. The prediction is parameterized using a multinomial logit model for the five-category educational attainment. First, parameters of the multinomial logit equation for the five-category educational attainment are estimated for non-migrants (‘residents’) in each of the five years t = 1992, 1997, 2002, 2006, and 2009 years. The ENADID/ENE data on all residents ages 18 to 54 is used for this estimation of parameters β_{kt}, one set for each of the four education outcomes k other than the reference, highest education outcome (any upper secondary). In Appendix Table A2.1, we present as an example of the *residents* equation, the coefficients estimated from the 2002 ENE. The 1992, 1997, 2006, and 2009 ENADID resident samples of 18 to 54 year olds are estimated similarly.

[APPENDIX TABLE A2.1 ABOUT HERE]

Second, a migrant selection equation is estimated. Its specification includes all the same predictors plus a “migrant” predictor and a “migrant*female” predictor, yielding a set of parameters β_{kt} but also two additional coefficients for each of the four education outcomes, γ_{1k} and γ_{2k}. We estimated these alternately from the quarterly migration events of the 2006 to 2010 National Survey of Occupation and Employment (ENOE) and the three-year events of the 2002-2005 Mexican Family Life Survey (MxFLS). Thus we exploit the differences between the longer-duration MxFLS and shorter-duration ENOE definitions of migration in robustness checks on these individual-level, ‘behavioral’ migrant selectivity parameters. The values of these parameters estimated alternately from the ENOE 2006-2010 and the 2002-2005 MxFLS are given in Table 3. The full set of coefficients is given in Appendix Table A2.2. We explored the specification and estimation of interactions between ‘migrant’ and other predictors and found no statistically robust patterns across the two sources.

[APPENDIX TABLES A2.2 AND A2.3 ABOUT HERE]

The predicted educational attainment of migrants in each year is then derived from the β_{kt} parameters estimated from the ENADID/ENE residents, plus the migrant-premium parameters γ_{1k} and γ_{2k} estimated from the ENOE 2006-2010. We use the ENOE in preference to the MxFLS due to its much larger migrant sample sizes (4,925 in the ENOE versus 554 in the MxFLS), and because the sampling designs and the definitions of migrants in the ENOE are closer to those in the ENADID/ENE series. We show in Appendix Table A2.3 compared to in Table 4, however, that the results differ little when substituting instead the γ_{1k} and γ_{2k} coefficients estimated from the MxFLS. For each year *t*, these male and female migrant logits are respectively $X'\beta_{kt}+\gamma_{1k}$ and $X'\beta_{kt}+\gamma_{1k}+\gamma_{2k}$, and the predicted educational probabilities for each of the four lower educational categories are:

$$\Pr\{K = k \mid X\} = \exp[X'\beta_{kt}+\gamma_{1k}] / (1 + \Sigma_j \exp[X'\beta_{jt}+\gamma_{1j}]) \qquad (1)$$

and for the reference, highest education outcome, the predicted probabilities for male migrants are given by:

$$\Pr\{K = k \mid X\} = 1 / (1 + \Sigma_j \exp[X'\beta_{jt}+\gamma_{1j}]) \qquad (1a)$$

For female migrants, the corresponding five probabilities are given by:

$$\Pr\{K = k \mid X\} = \exp[X'\beta_{kt}+\gamma_{1k}+\gamma_{2k}] / (1 + \Sigma_j \exp[X'\beta_{jt}+\gamma_{1j}+\gamma_{2j}]) \qquad (2)$$

and

$$\Pr\{K = k \mid X\} = 1 / (1 + \Sigma_j \exp[X'\beta_{jt}+\gamma_{1j}+\gamma_{2j}]) \tag{2b}$$

The final step is simply attaching these predicted probabilities across the distribution of migrants' regressors X. This distribution comes from the ENADID/ENE annual all-migrant series. The male migrant education distribution is then derived by weighting the probabilities of equations (1) and (1a) by the observed distribution of male migrants by age, relationship to head, and place-size, and the female migrant education distribution is derived by weighting the probabilities of equations (2) and (2a) by the observed distribution of female migrants by age, relationship to head, and place-size. The final step is to weight the predicted male and female emigrants' educational attainment distributions by the observed ENADID/ENE proportions of male and female migrants. The predicted educational distributions of all migrants are those shown in Table 4. The alternate predicted educational distributions of all migrants when the MxFLS is used as the auxiliary data source from which the γ_{1k} and γ_{2k} coefficients are estimated are shown in Appendix Table A2.3.

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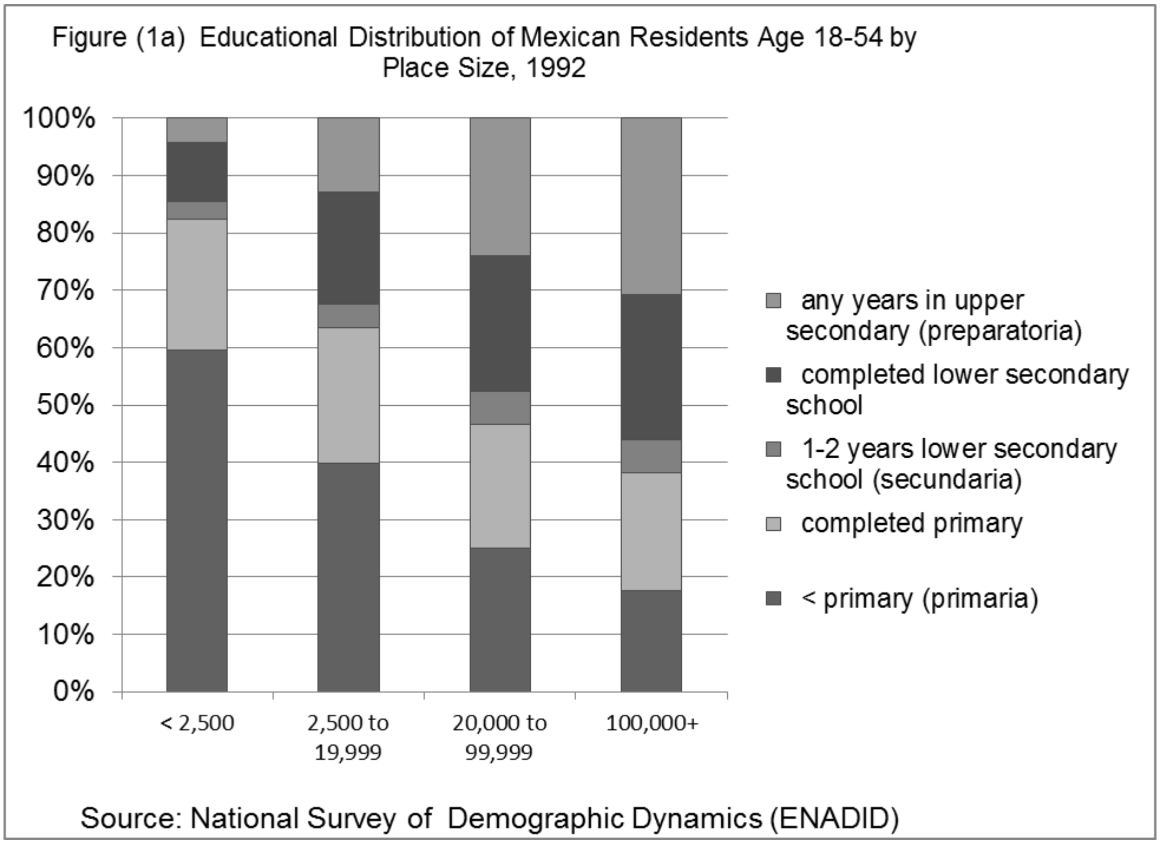
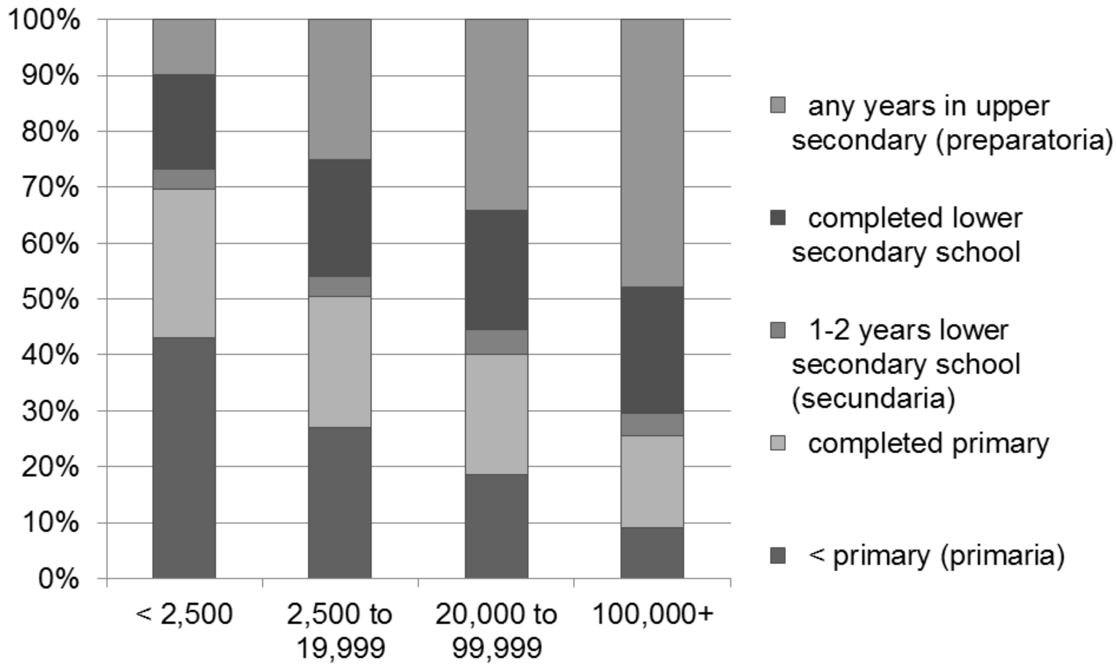


Figure (1a) Educational Distribution of Mexican Residents Age 18-54 by Place Size, 1992
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
< 2,500
2,500 to 19,999
20,000 to 99,999
100,000+
any years in upper secondary (preparatoria)
completed lower secondary school
1-2 years lower secondary school (secundaria)
completed primary
< primary (primaria)
Source: National Survey of Demographic Dynamics (ENADID)

Figure 1(b) Educational Distribution of Mexican Residents Age 18-54 by Place Size, 2002



Source: National Survey of Employment (ENE)

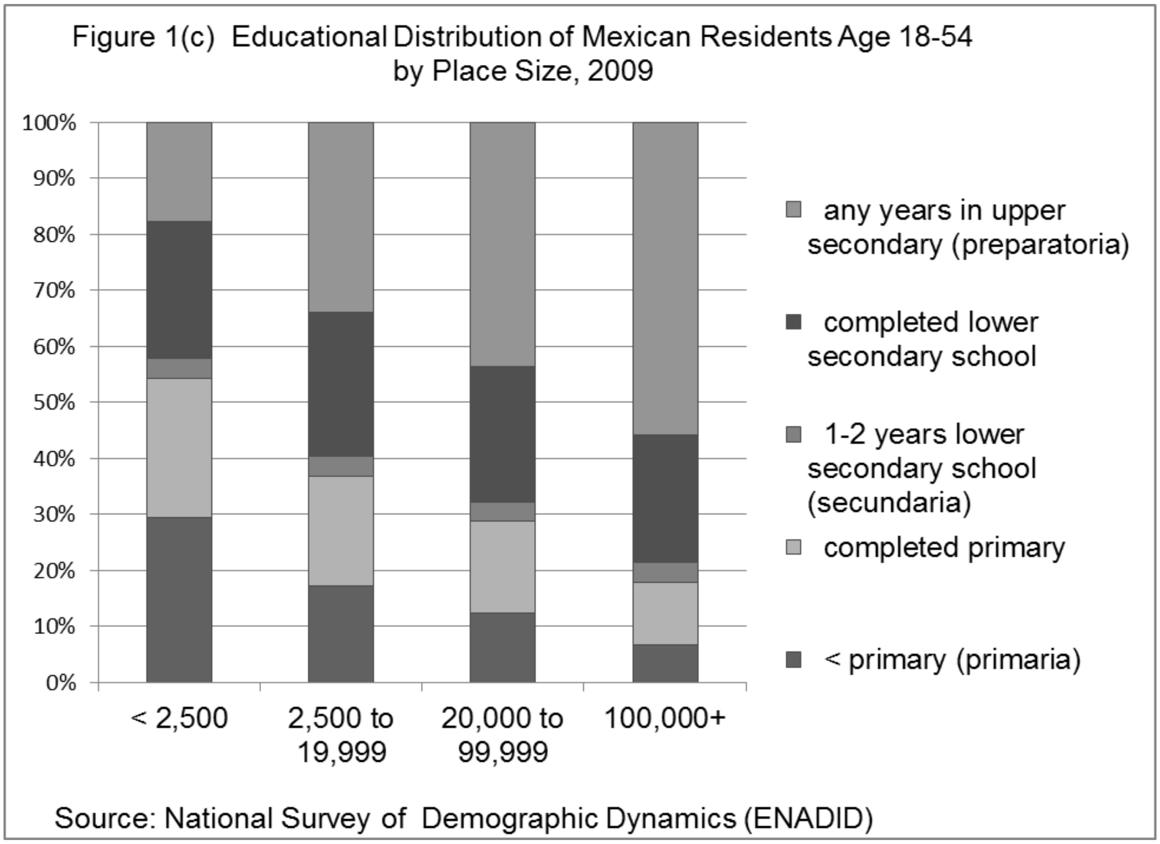


Figure 1(c) Educational Distribution of Mexican Residents Age 18-54
by Place Size, 2009
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
any years in upper secondary (preparatoria)
completed lower secondary school
1-2 years lower secondary school (secundaria)
completed primary
< primary (primaria)
< 2,500
2,500 to 19,999
20,000 to 99,999
100,000+
Source: National Survey of Demographic Dynamics (ENADID)

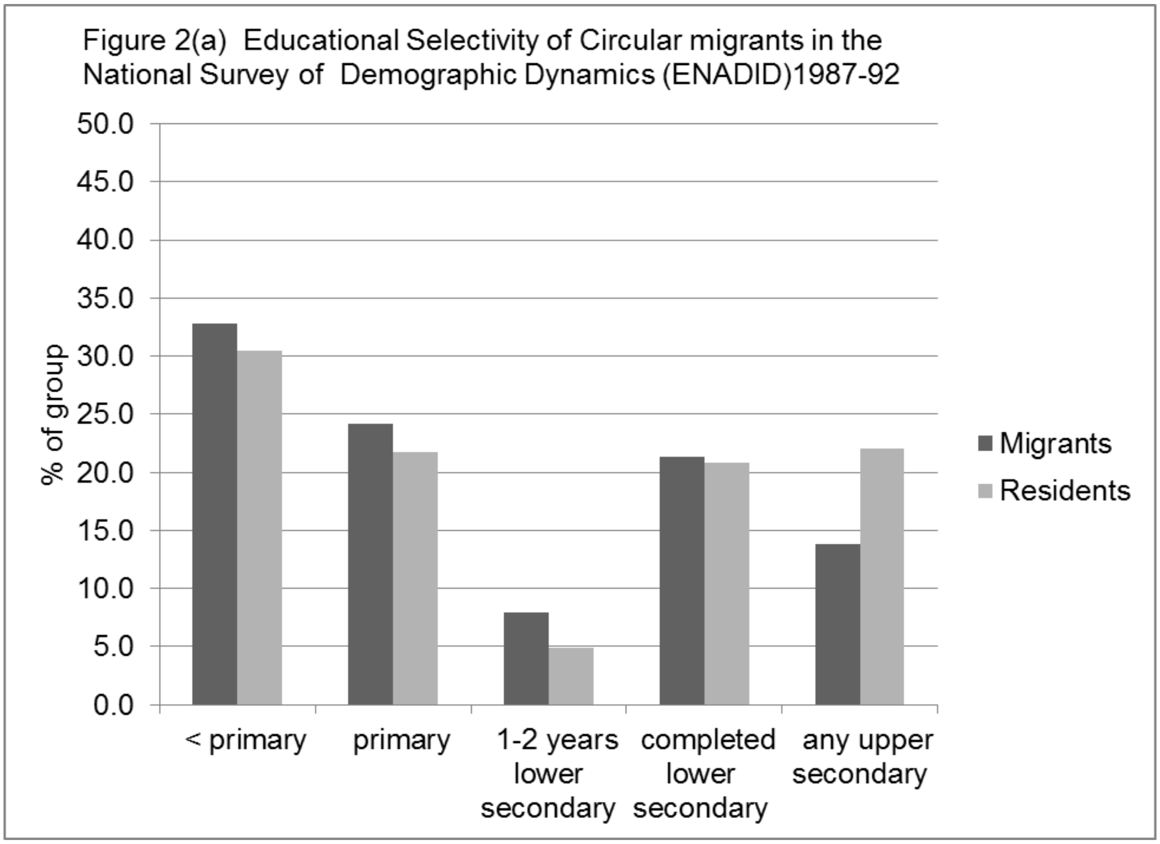


Figure 2(a) Educational Selectivity of Circular migrants in the National Survey of Demographic Dynamics (ENADID)1987-92
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
% of group
< primary
primary
1-2 years lower secondary
completed lower secondary
any upper secondary
Migrants
Residents

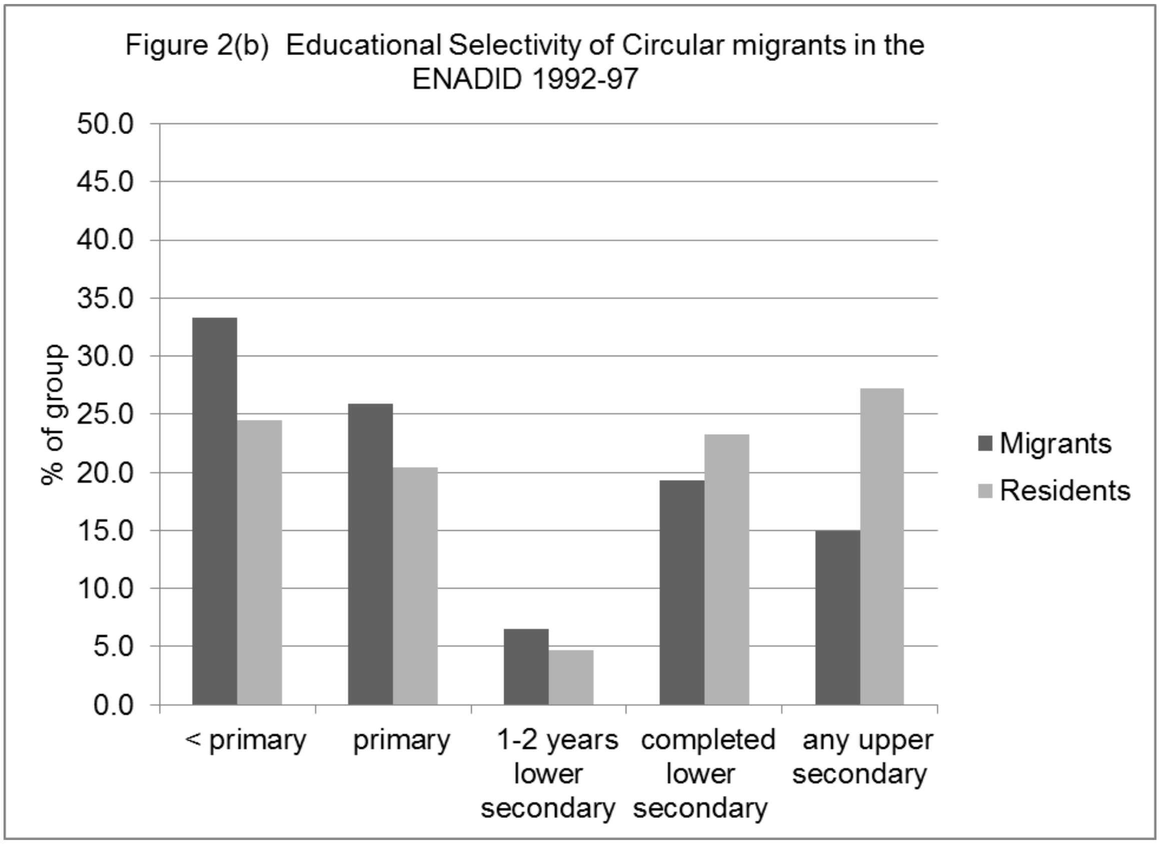


Figure 2(b) Educational Selectivity of Circular migrants in the ENADID 1992-97
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
% of group
< primary
primary
1-2 years lower secondary
completed lower secondary
any upper secondary
Migrants
Residents

Figure (2c) Educational Selectivity of Circular Migrants in the 2002 National Survey of Employment (ENE) Migration Module

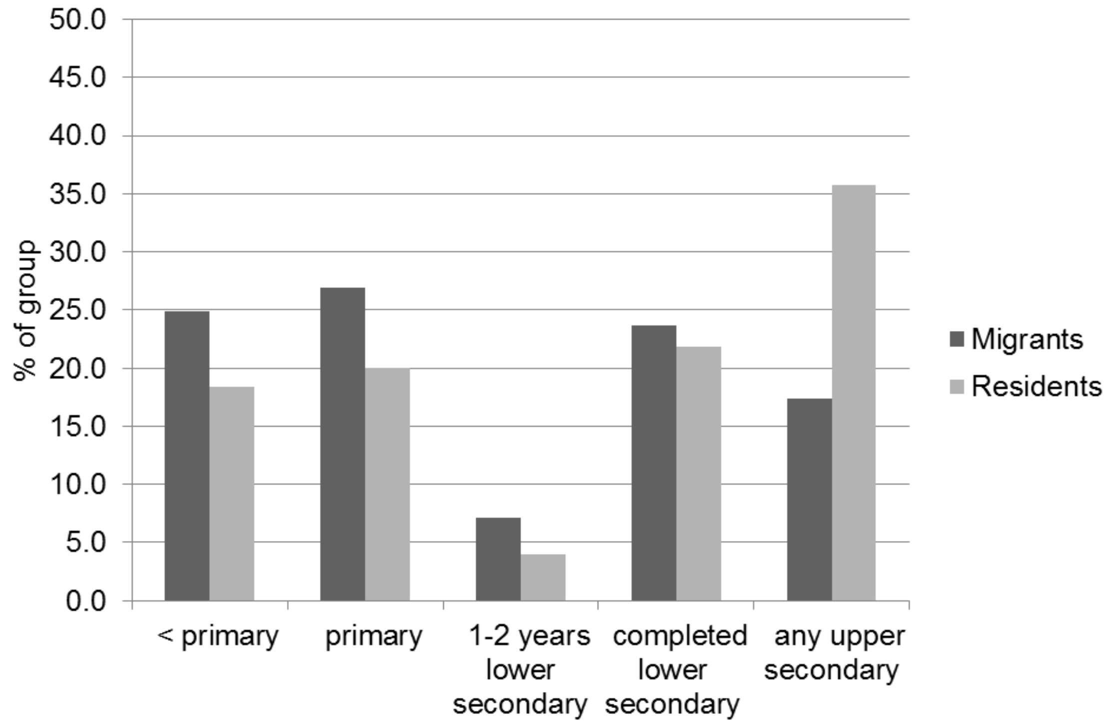


Figure 2(d) Educational Selectivity of Circular migrants in the ENADID 2004-09

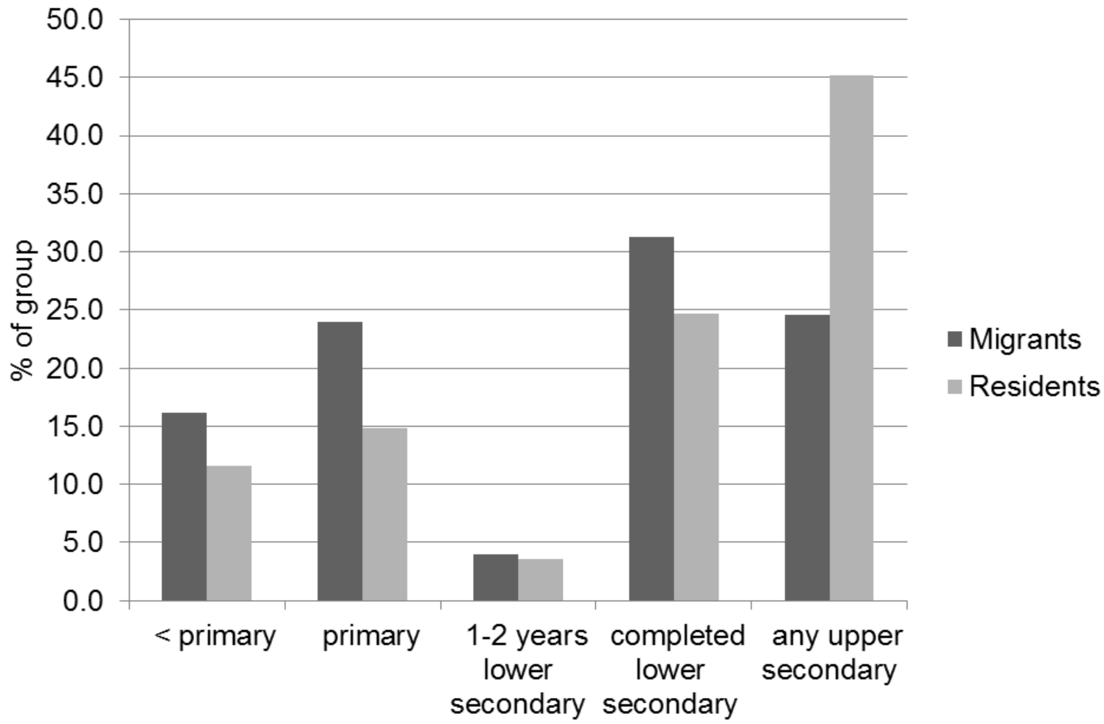
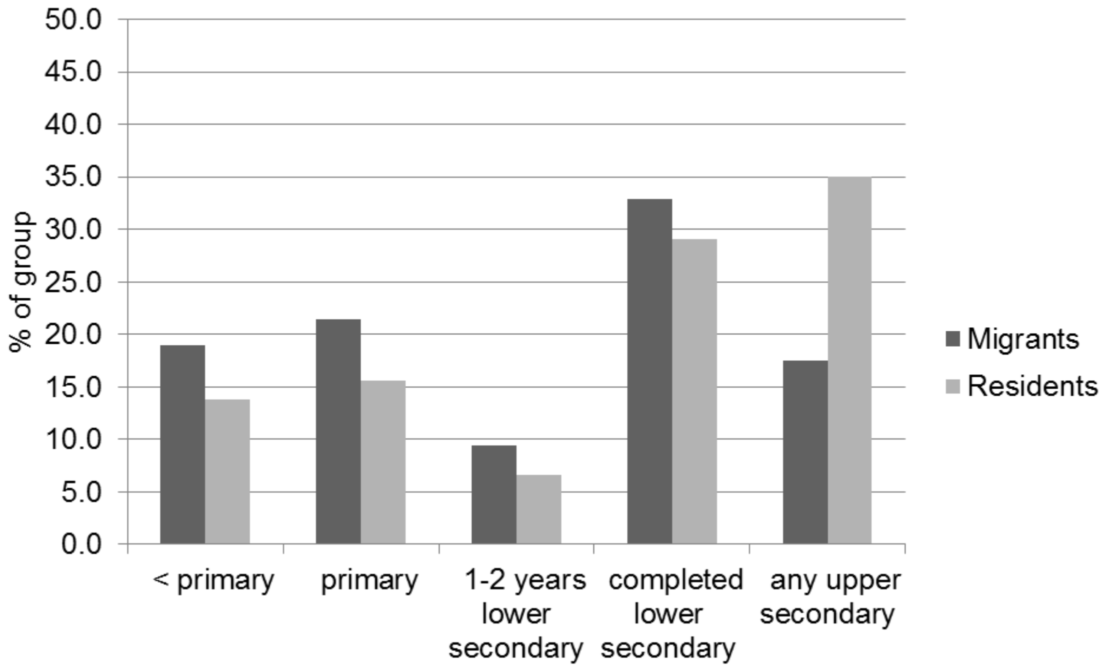
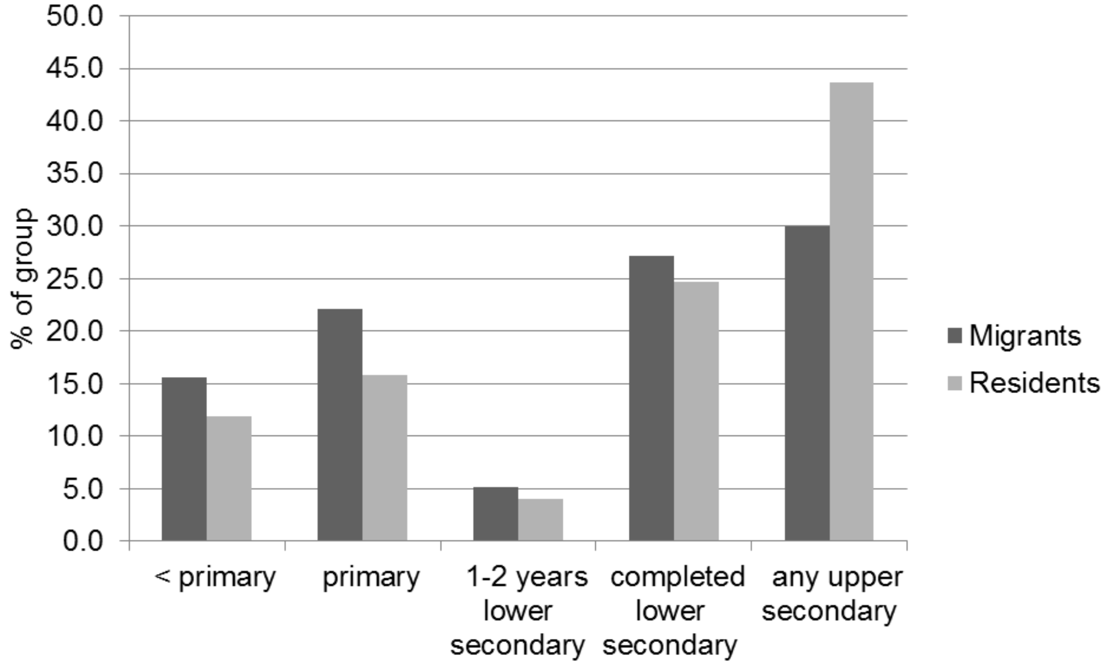


Figure 3 Educational Selectivity of Mexican Family Life Survey (MxFLS) 2002 to 2005 Migrants



Source: Authors' calculations from the MxFLS

Figure 4 Educational Selectivity of Quarterly migrants in the National Survey of Occupation and Employment (ENOE 2006-2010)



Source: Authors' calculations from the ENOE

Table 1 Socio-demgoraphic characteristics of annual Mexico-U.S. migrants and Mexican residents age 18 to 54 in 1992-2009

	1991/92 migrants^	1992 residents	1996/97 migrants^	1997 residents	2001/02 migrants^	2002 residents	2005/06 migrants^	2006 residents	2008/09 migrants^	2009 residents
Place size										
< 2,500 ("Rural")	47.4	25.2	45.7	22.4	45.3	20.9	43.0	20.5	46.7	19.4
2,500 to 19,999	17.7	13.7	19.8	15.3	18.9	12.7	20.8	13.1	21.1	13.1
20,000 to 99,999	8.6	8.2	12.5	11.2	16.8	13.3	13.3	14.2	11.3	14.6
100,000+	26.3	52.9	22.0	51.1	19.1	53.1	22.8	52.2	21.0	52.9
Percentage male	83.2	48.4	82.5	47.9	87.0	47.0	82.6	47.9	80.6	48.1
Percentage unauthorized*	-	-	-	-	80.8	-	84.7	-	71.3	-
Age group										
18 to 24	43.1	28.7	41.3	28.7	37.7	25.6	34.2	24.5	39.2	24.5
25 to 34	30.7	35.1	33.1	31.7	30.7	30.3	34.2	30.2	28.1	28.6
35 to 54	26.2	36.2	25.7	39.6	31.6	44.2	31.6	45.3	32.7	46.9
Relationship to head										
Head or spouse/partner	42.0	63.8	41.8	63.2	47.0	62.4	49.2	62.7	27.4	58.6
Child	47.1	27.9	43.4	28.4	43.0	29.1	37.9	28.7	46.1	29.4
Other	10.9	8.3	14.8	8.4	10.0	8.5	12.9	8.6	26.5	12.0
Population number of migrants	497,577		636,642		726,493		418,853		243,707	
sample n	1,936	122,963	2,579	155,144	1,566	300,576	658	70,306	807	175,655

Notes:
ENADID: National Survey of Demographic Dynamics
ENE National Employment Survey
^ All who migrated in the last year
* Not authorized to work in the U.S.

Table 2 Educational selectivity of male land-border Mexican emigrants to the U.S., by rural/urban residence and by birth cohort
(Percentages)

All Mexico

Highest educational attainment	1969-73 birth cohort			1974-78 birth cohort			1979-83 birth cohort		
	Migrants	Residents	Difference	Migrants	Residents	Difference	Migrants	Residents	Difference
< primary	19.6	17.7	1.8	15.1	15.4	-0.2	12.3	12.8	-0.5
completed primary	31.4	20.1	11.3	30.4	20.5	9.9	26.3	16.9	9.3
1-2 years lower secondary school	12.3	7.0	5.3	14.8	6.1	8.7	17.5	5.9	11.6
completed lower secondary school	26.1	29.3	-3.2	27.4	31.2	-3.8	31.2	29.2	2.0
any years in upper secondary	10.5	25.9	-15.3	12.2	26.8	-14.6	12.8	35.2	-22.4
total	100.0	100.0		100.0	100.0		100.0	100.0	
sample n	3,696			4,868			3,593		

Rural Mexico

	1969-73 birth cohort			1974-78 birth cohort			1979-83 birth cohort		
	Migrants	Residents	Difference	Migrants	Residents	Difference	Migrants	Residents	Difference
< primary (primaria)	23.2	37.2	-13.9	17.7	30.7	-13.1	18.3	27.0	-8.7
completed primary	39.8	31.2	8.6	35.6	32.9	2.7	30.0	29.6	0.3
1-2 years middle school (secundaria)	8.5	5.9	2.6	13.8	5.3	8.6	14.5	5.6	8.9
completed middle school	21.7	18.7	3.0	25.0	22.8	2.2	29.3	24.9	4.4
any years in upper secondary (preparatoria)	6.8	7.0	-0.2	7.9	8.3	-0.4	7.9	12.8	-4.9
total	100.0	100.0		100.0	100.0		100.0	100.0	
sample n	1,612			2,182			1,714		

Urban Mexico

	1969-73 birth cohort			1974-78 birth cohort			1979-83 birth cohort		
	Migrants	Residents	Difference	Migrants	Residents	Difference	Migrants	Residents	Difference
< primary (primaria)	16.2	10.8	5.3	13.1	10.3	2.8	8.0	8.3	-0.3
completed primary	25.4	16.2	9.2	26.2	16.5	9.7	23.5	12.9	10.6
1-2 years middle school (secundaria)	16.1	7.4	8.7	15.6	6.4	9.2	19.9	6.0	13.9
completed middle school	29.2	33.1	-3.9	29.4	34.0	-4.6	32.2	30.5	1.7
any years in upper secondary (preparatoria)	13.1	32.5	-19.4	15.7	32.8	-17.0	16.4	42.3	-25.9
total	100.0	100.0		100.0	100.0		100.0	100.0	
sample n	2,084			2,686			1,879		

Notes:

Migrant education is predicted from multinomial logistic regressions run separately for all intending migrants, rural migrants, and urban migrants, 1993-2004 Source: Encuesta de Migración en la Frontera Norte de México (EMIF), 1993/94 to 2003/04 waves, (Conapo 2010), with predicted values weighted by the distribution of migrants by age of the 1974-78 birth cohort.

Resident education is derived from 1990 and 2000 Census and 1995 Conteo Public Use Microdata Samples (University of Minnesota 2006).

Table 3 Migration Selectivity Parameters Estimated from the 2002-2005 Mexican Family Life Survey (MxFLS) and the 2006-2010 National Survey of Employment and Occupation (ENOE)

	< Primary		Completed Primary		Some lower secondary		Completed lower secondary	
A. MxFLS 2002-2005								
Migrant (reference=non-migrant)	1.102	***	1.120	***	1.089	***	0.899	***
Standard Error	*0.214*		*0.205*		*0.240*		*0.185*	
Migrant*female	-1.393	***	-0.890	**	-0.701	+	-0.559	*
Standard Error	*0.345*		*0.315*		*0.407*		*0.280*	
Migrants	554							
Sample size (all migrants + non-migrants)	17,972							
B. ENOE 2006-2010								
Migrant (reference=non-migrant)	0.991	***	1.204	***	1.132	***	0.884	***
Standard Error	*0.058*		*0.053*		*0.078*		*0.048*	
Migrant*female	-1.340	***	-1.116	***	-0.898	***	-0.957	***
Standard Error	*0.125*		*0.100*		*0.170*		*0.085*	
Migrants	4,925							
Sample size (all migrants + non-migrants)	737,056							

Notes:

Reference educational attainment outcome = any upper secondary school (may have completed upper secondary, may have attended college)

Both the MxFLS and ENOE equations control for age, sex, relationship to household head, and place-size
(see Appendix Table A2.1 for full results, and Appendix Table A1.4 for descriptive statistics on all variables)

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$

Table 4 Predicted education of ENADID/ENE series of all emigrants in the last year, versus residents age 18-54

	male migrants	male residents	difference	female migrants	female residents	difference	weighted to ENADID/ENE male percentages: all migrants	all residents	difference
ENADID 1991/92									
Education									
< primary (primaria)	32.9	24.0	8.9	25.8	27.3	-1.4	31.7	25.7	6.0
completed primary	32.1	22.0	10.1	32.8	25.1	7.7	32.2	23.6	8.6
1-2 years lower secondary school (secundaria)	7.4	6.2	1.1	5.4	4.3	1.1	7.0	5.3	1.8
completed lower secondary school	17.9	19.9	-1.9	26.8	24.8	2.0	19.4	22.4	-3.0
any years in upper secondary (preparatoria)	9.6	27.9	-18.2	9.1	18.5	-9.4	9.6	23.0	-13.5
ENADID 1996/97									
Education									
< primary (primaria)	29.1	23.5	5.5	16.3	27.4	-11.2	26.8	25.6	1.3
completed primary	33.1	18.9	14.2	37.3	22.1	15.2	33.8	20.5	13.3
1-2 years lower secondary school (secundaria)	10.0	5.3	4.6	7.0	3.8	3.1	9.5	4.6	4.9
completed lower secondary school	21.0	21.3	-0.3	31.9	23.8	8.1	22.9	22.6	0.3
any years in upper secondary (preparatoria)	6.8	30.9	-24.1	7.5	22.9	-15.3	6.9	26.8	-19.8
ENE 2001/02									
Education									
< primary (primaria)	21.8	17.9	4.0	19.1	21.3	-2.2	21.5	19.7	1.8
completed primary	27.9	18.8	9.1	28.2	21.3	6.9	27.9	20.1	7.8
1-2 years lower secondary school (secundaria)	6.8	4.6	2.2	4.9	3.2	1.6	6.6	3.9	2.7
completed lower secondary school	24.8	22.0	2.7	24.7	20.2	4.6	24.7	21.1	3.7
any years in upper secondary (preparatoria)	18.7	36.7	-18.0	23.1	33.9	-10.9	19.2	35.3	-16.0
ENADID 2005/06									
Education									
< primary (primaria)	21.5	16.3	5.3	21.0	20.0	1.0	21.5	18.2	3.3
completed primary	25.7	16.1	9.6	24.0	17.8	6.2	25.4	17.0	8.4
1-2 years lower secondary school (secundaria)	7.4	4.7	2.7	5.7	3.7	2.0	7.1	4.2	2.9
completed lower secondary school	26.1	22.4	3.6	25.0	20.8	4.2	25.9	21.6	4.3
any years in upper secondary (preparatoria)	19.3	40.5	-21.2	24.3	37.6	-13.4	20.2	39.0	-18.9

ENADID 2008/09

Education									
< primary (primaria)	17.8	12.5	5.2	14.8	14.2	0.5	17.2	13.4	3.8
completed primary	24.6	14.8	9.8	22.6	16.4	6.2	24.2	15.6	8.6
1-2 years lower secondary school (secundaria)	6.3	4.1	2.2	4.6	3.0	1.6	6.0	3.6	2.4
completed lower secondary school	28.4	24.1	4.3	27.7	23.1	4.6	28.2	23.6	4.6
any years in upper secondary (preparatoria)	23.0	44.4	-21.5	30.3	43.2	-12.9	24.4	43.8	-19.4

Notes:

Emigrant education is derived from multinomial logit coefficients predicting education given socio-demographic characteristics from the ENADID/ENE residents combined with migrant coefficients estimated from ENOE 2006-2010 data from a model with the same socio-demographic characteristics (see text)

ENADID: National Survey of Demographic Dynamics

ENE: National Survey of Employment

ENOE: National Survey of Occupation and Employment

Appendix Table A1.1 Educational Attainment of Mexican residents age 18 to 54 by place size, 1992 to 2009

	Place Size				
	< 2,500	2,500 to 19,999	20,000 to 99,999	100,000+	All place sizes
Education		**ENADID 1992**			
< primary (primaria)	59.6	39.8	25.0	17.7	31.5
completed primary	22.8	23.8	21.7	20.6	21.2
1-2 years lower secondary school (secundaria)	3.1	4.0	5.7	5.7	5.2
completed lower secondary school	10.1	19.5	23.6	25.2	20.3
any years in upper secondary (preparatoria)	4.3	12.9	24.0	30.8	20.9
sample n	46,920	15,977	14,407	45,659	122,963
place-size percentage of all residents	25.2	13.7	8.2	52.9	100.0
Education		**ENADID 1997**			
< primary (primaria)	50.6	31.4	24.4	13.1	25.6
completed primary	25.5	23.6	20.8	17.4	20.5
1-2 years lower secondary school (secundaria)	3.6	3.9	4.9	5.1	4.6
completed lower secondary school	13.8	21.5	22.6	26.8	22.6
any years in upper secondary (preparatoria)	6.5	19.6	27.3	37.6	26.7
sample n	43,339	26,083	16,256	69,466	155,144
place-size percentage of all residents	22.4	15.3	11.2	51.0	100.0
Education		**ENE 2002**			
< primary (primaria)	43.0	26.9	18.7	9.1	19.7
completed primary	26.7	23.5	21.4	16.5	20.2
1-2 years lower secondary school (secundaria)	3.5	3.7	4.6	3.9	3.9
completed lower secondary school	16.8	20.7	21.3	22.7	21.0
any years in upper secondary (preparatoria)	10.0	25.2	34.1	47.8	35.2
sample n	30,453	24,696	29,395	216,032	300,576
place-size percentage of all residents	20.9	12.7	13.3	53.1	100.0
Education		**ENADID 2006**			
< primary (primaria)	38.9	22.4	16.7	9.4	18.2
completed primary	24.1	20.9	17.8	13.0	17.0
1-2 years lower secondary school (secundaria)	4.1	4.4	5.0	4.0	4.2
completed lower secondary school	18.8	23.8	21.6	22.1	21.6
any years in upper secondary (preparatoria)	14.2	28.5	38.9	51.4	39.0
sample n	19,268	9,797	10,922	30,319	70,306
place-size percentage of all residents	20.5	13.1	14.2	52.2	100.0
Education		**ENADID 2009**			
< primary (primaria)	29.5	17.3	12.5	6.8	13.4
completed primary	24.7	19.4	16.3	11.2	15.6
1-2 years lower secondary school (secundaria)	3.7	3.7	3.5	3.5	3.6
completed lower secondary school	24.3	25.6	24.1	22.7	23.6
any years in upper secondary (preparatoria)	17.8	33.9	43.6	55.8	43.8
sample n	32,127	23,593	25,108	94,827	175,655
place-size percentage of all residents	19.4	13.1	14.6	52.9	100.0

Notes:
Authors' caluculations from the National Survey of Demographic Dynamics (ENADID) and National Survey of Employment (ENE) 4th quarter 2002 and 2002 Migration Module

Appendix Table A1.2 Characteristics of circular migrants compared to all residents age 18 to 54 in the ENADID/ENE household surveys

	ENADID 1992			ENADID 1997			ENE 2002			ENADID 2009		
	circular migrants*	usual residents	difference	circular migrants*	usual residents	difference	circular migrants*	usual residents	difference	circular migrants~	usual residents	difference
Age group												
18 to 24	27.2	28.7	-1.4	23.9	28.7	-4.9	24.1	25.6	-1.5	30.0	24.5	5.5
25 to 34	38.8	35.1	3.8	40.5	31.7	8.9	35.5	30.3	5.2	37.3	28.6	8.7
35 to 54	33.9	36.2	-2.3	35.6	39.6	-4.0	40.4	44.2	-3.8	32.7	46.9	-14.2
Percentage male	85.0	48.4	36.6	88.6	47.9	40.7	87.7	47.0	40.8	88.5	48.1	40.4
Relationship to head												
Head or spouse/partner	69.3	63.8	5.5	73.0	63.2	9.8	67.6	62.4	5.2	65.8	58.6	7.2
Child	25.0	27.9	-2.9	21.0	28.4	-7.4	26.3	29.1	-2.9	24.1	29.4	-5.3
Other	5.7	8.3	-2.6	6.0	8.4	-2.4	6.1	8.5	-2.4	10.1	12.0	-1.9
Percentage unauthorized**	-	-		84.6	-		80.5	-		77.0	-	
Place size												
< 2,500 ("Rural")	31.1	25.2	5.9	40.8	22.4	18.4	39.0	20.9	18.2	43.6	19.4	24.2
2,500 to 19,999	18.5	13.7	4.8	18.0	15.3	2.7	16.8	12.7	4.1	18.1	13.1	5.0
20,000 to 99,999	8.1	8.2	-0.1	11.8	11.2	0.6	17.4	13.3	4.0	12.6	14.6	-2.0
100,000+	42.3	52.9	-10.6	29.4	51.1	-21.7	26.7	53.1	-26.3	25.7	52.9	-27.2
Education												
< primary (primaria)	32.8	31.5	1.2	33.3	25.6	7.7	24.9	19.7	5.2	16.2	13.4	2.8
completed primary	24.2	21.2	2.9	25.9	20.5	5.4	26.9	20.2	6.8	23.9	15.6	8.3
1-2 years lower secondary school (secundaria)	8.0	5.2	2.8	6.5	4.6	1.9	7.1	3.9	3.2	4.0	3.6	0.4
completed lower secondary school	21.3	20.3	1.0	19.3	22.6	-3.3	23.6	21.0	2.6	31.3	23.6	7.7
any years in upper secondary (preparatoria)	13.8	20.9	-7.1	14.9	26.7	-11.8	17.4	35.2	-17.8	24.6	43.8	-19.2
Education, age standardized for residents+												
< primary	32.8	30.5	2.3	33.3	24.5	8.8	24.9	18.4	6.5	16.2	11.6	4.5
primary	24.2	21.8	2.4	25.9	20.4	5.6	26.9	20.0	6.9	23.9	14.9	9.1
1-2 years lower secondary	8.0	4.9	3.1	6.5	4.6	1.9	7.1	4.0	3.2	4.0	3.6	0.4
completed lower secondary	21.3	20.8	0.5	19.3	23.3	-4.0	23.6	21.8	1.8	31.3	24.7	6.6
any upper secondary	13.8	22.0	-8.3	14.9	27.2	-12.3	17.4	35.8	-18.4	24.6	45.2	-20.6
sample n	3,917	122,963		4,594	155,144		2,313	300,576		1,029	175,655	

Notes:

* Those who are part of the Mexico survey household and who "went to the U.S. for work or to look for work" and last departed in any of the last 5 calendar years
~ Those who are part of the Mexico survey household and who "went to U.S. to live in last 5 years" and last departed in any of the last 5 calendar years
^ All who migrated in the last 5 years and are still "part of the household"
** Not authorized to work in the U.S.
+ Residents' educational attainment category proportions by age are reweighted by the age distribution of circular emigrants

Appendix Table A1.3 Characteristics of 2002-2005 migrants and 2002 non-migrants in the Mexican Family Life Survey (MxFLS) and 2006-2010National Survey of Employment and Occupation (ENOE)

	MxFLS 2002			ENOE 2006-10		
	migrants	residents	difference	migrants	residents	difference
Age group						
18 to 24	53.7	25.3	28.4	38.2	25.8	12.4
25 to 34	28.1	29.9	-1.8	31.7	29.8	1.9
35 to 54	18.2	44.8	-26.6	30.0	44.4	-14.4
Percentage male	63.8	46.0	17.8	79.8	46.5	33.4
Relationship to head						
Head or spouse/partner	27.0	58.8	-31.8	42.3	61.5	-19.2
Child	58.9	32.9	26.0	46.1	28.2	18.0
Other	14.1	8.3	5.8	11.5	10.3	1.3
Place size						
< 2,500 ("Rural")	41.2	21.1	20.1	37.4	18.4	18.9
2,500 to 19,999	24.9	16.5	8.4	15.7	12.6	3.1
20,000 to 99,999	8.1	10.9	-2.8	14.6	14.5	0.1
100,000+	25.8	51.5	-25.7	32.3	54.5	-22.1
Education						
< primary (primaria)	18.9	20.3	-1.4	15.6	14.3	1.3
completed primary	21.4	18.5	2.9	22.1	17.2	4.9
1-2 years lower secondary school (secundaria)	9.4	5.3	4.1	5.2	3.8	1.4
completed lower secondary school	32.8	25.4	7.4	27.1	23.5	3.6
any years in upper secondary (preparatoria)	17.5	30.5	-13.1	30.0	41.2	-11.2
Education (Standardized to Migrants' Age Distribution)						
< primary	18.9	13.8	5.1	15.6	11.9	3.7
primary	21.4	15.6	5.8	22.1	15.8	6.4
1-2 years lower secondary	9.4	6.6	2.8	5.2	4.0	1.2
completed lower secondary	32.8	29.0	3.8	27.1	24.7	2.4
any upper secondary	17.5	35.0	-17.6	30.0	43.7	-13.7
sample n	554	18,036		8,967	1,363,394	

Notes:
Authors' calculations from the MxFLS and ENOE

Appendix Table A1.4 Characteristics of three cohorts of male border-survey migrants versus Census educational attainment and place size

	1969-73 cohort			1974-78 cohort			1979-83 cohort		
	all migrants	ages 18-20 at 1990 Census	difference	all migrants	ages 18-20 at 1995 Conteo	difference	all migrants	ages 18-20 at 2000 Census	difference
Age group									
18 to 24	26.0	-		50.3	-		96.5	-	
25 to 34	72.9	-		49.7	-		3.5	-	
35 to 54	1.0	-		-	-		-	-	
Percentage unauthorized	73.9	-		91.4	-		95.6	-	
Place size									
< 2,500 ("Rural")	41.9	26.4	15.5	44.9	24.9	19.9	45.0	24.0	21.0
2,500 to 19,999		24.6			27.2			15.3	
20,000 to 99,999								11.8	
100,000+		49.0			47.9			49.0	
Education									
< primary (primaria)	19.9	18.0	1.9	15.0	13.0	1.9	11.8	12.4	-0.7
completed primary	31.5	20.4	11.1	30.4	20.4	10.0	26.7	15.8	10.9
1-2 years lower secondary school (secundaria)	12.6	7.1	5.6	15.2	6.3	8.9	15.1	6.8	8.4
completed lower secondary school	25.7	29.6	-3.9	27.7	30.9	-3.3	32.6	26.5	6.1
any years in upper secondary (preparatoria)	10.3	25.0	-14.7	11.8	29.4	-17.6	13.9	38.5	-24.7
sample n	3,511	541,295		4,430	21,292		3,004	279,511	

Notes:
Authors' caluculations from the 1993-2004 EMIF and the 1990, 1995, and 2000 Mexican Censuses and 'Conteo'

Appendix Table A2.1 Resident Education Model Parameters Estimated from the 2002 National Employment Survey (ENE)

	< Primary	Completed Primary	Some lower secondary	Completed lower secondary
Intercept	-0.027	0.133	-1.132	0.330
SE	*0.020*	*0.019*	*0.030*	*0.018*
Female (reference=male)	0.281	0.194	-0.303	-0.031
SE	*0.012*	*0.011*	*0.020*	*0.010*
Relationship to Head (reference=child of head)				
Head or Spouse	0.878	0.837	0.799	0.565
SE	*0.017*	*0.015*	*0.026*	*0.013*
Other	0.872	0.825	0.532	0.552
SE	*0.025*	*0.021*	*0.038*	*0.019*
Age (reference=18 to 24)				
25 to 34	0.463	0.174	-0.171	-0.008
SE	*0.020*	*0.016*	*0.027*	*0.014*
35 to 54	1.508	0.589	-0.494	-0.348
SE	*0.020*	*0.017*	*0.030*	*0.015*
Place Size (reference=rural)				
Small urban (2,500 to 19,999)	-1.571	-1.166	-0.899	-0.739
SE	*0.021*	*0.021*	*0.038*	*0.022*
Medium urban (20,000 to 99,999)	-2.322	-1.616	-1.017	-1.027
SE	*0.021*	*0.021*	*0.035*	*0.021*
Large urban (100,000+)	-3.442	-2.250	-1.514	-1.306
SE	*0.018*	*0.017*	*0.028*	*0.017*
-2 log likelihood	792,529			
Sample size (all migrants + non-migrants)	299,777			

Notes:
Reference educational attainment outcome = any upper secondary school
(may have completed upper secondary, may have attended college)

Appendix Table A2.2 Migration Selectivity Parameters Estimated from the 2002-2005 Mexican Family Life Survey (MxFLS) and the 2006-2010 (ENOE)

	MxFLS 2002-2005				ENOE 2006-2010			
	< Primary	Completed Primary	Some lower secondary	Completed lower secondary	< Primary	Completed Primary	Some lower secondary	Completed lower secondary
Intercept	-0.396	-0.368	-0.916	0.331	-0.320	-0.177	-1.348	0.108
SE	*0.080*	*0.076*	0.104	*0.068*	*0.013*	*0.012*	*0.019*	*0.011*
Migrant (reference=non-migrant)	1.102	1.120	1.089	0.899	0.991	1.204	1.132	0.884
SE	*0.214*	*0.205*	0.240	*0.185*	*0.058*	*0.053*	*0.078*	*0.048*
Migrant*female	-1.393	-0.890	-0.701	-0.559	-1.340	-1.116	-0.898	-0.957
SE	*0.345*	*0.315*	0.407	*0.280*	*0.125*	*0.100*	*0.170*	*0.085*
Female (reference=male)	0.429	0.348	-0.115	0.076	0.468	0.404	-0.064	0.340
SE	*0.049*	*0.047*	*0.072*	*0.041*	*0.008*	*0.007*	*0.013*	*0.006*
Relationship to Head (reference=child of head)								
Head or Spouse	0.797	0.951	0.694	0.511	0.234	0.265	0.283	0.174
SE	*0.069*	*0.066*	*0.099*	*0.055*	*0.007*	*0.011*	*0.011*	*0.005*
Other	0.995	0.820	0.545	0.378	-0.150	-0.181	-0.189	-0.125
SE	*0.095*	*0.091*	*0.126*	*0.077*	*0.008*	*0.007*	*0.012*	*0.006*
Age (reference=18 to 24)								
25 to 34	0.511	0.203	-0.559	0.037	0.861	0.654	0.070	0.376
SE	*0.080*	*0.071*	*0.099*	*0.055*	*0.013*	*0.010*	*0.016*	*0.008*
35 to 54	1.522	0.567	-0.660	-0.349	1.894	1.172	0.043	0.420
SE	*0.083*	*0.076*	*0.112*	*0.065*	*0.012*	*0.010*	*0.017*	*0.008*
Place Size (reference=rural)								
Small urban (2,500 to 14,999)	-1.011	-0.602	-0.079	-0.375	-1.373	-1.017	-0.632	-0.540
SE	*0.080*	*0.082*	*0.118*	*0.081*	*0.014*	*0.014*	*0.024*	*0.013*
Medium urban (15,000 to 99,999)	-2.259	-1.503	-1.080	-0.700	-2.048	-1.485	-0.880	-0.791
SE	*0.092*	*0.091*	*0.144*	*0.082*	*0.014*	*0.013*	*0.023*	*0.012*
Large urban (100,000+)	-2.702	-1.772	-1.066	-0.967	-3.010	-1.992	-1.200	-1.009
SE	*0.067*	*0.067*	*0.101*	*0.064*	*0.011*	*0.011*	*0.018*	*0.010*
-2 log likelihood	49,584				1,987,330			
Migrants	554				4,925			
Sample size (all migrants + non-migrants)	17,972				737,056			

Notes:

Reference educational attainment outcome = any upper secondary school (may have completed upper secondary, may have attended college)

Appendix Table A2.3 Predicted education of ENADID/ENE series of all emigrants in the last year, versus residents age 18-54, using MxFLS migrant coefficients

	Male			Female			All		
	migrants	residents	difference	migrants	residents	difference	migrants	residents	difference
ENADID 1991/92									
Education									
< primary (primaria)	32.5	25.2	7.3	25.2	27.2	-1.9	31.2	26.2	5.1
completed primary	30.0	20.3	9.7	30.3	21.9	8.4	30.0	21.1	8.9
1-2 years lower secondary school (secundaria)	7.3	6.3	1.0	5.3	4.7	0.6	7.0	5.5	1.5
completed lower secondary school	20.0	20.7	-0.7	29.6	26.5	3.1	21.7	23.7	-2.1
any years in upper secondary (preparatoria)	10.2	27.6	-17.4	9.6	19.7	-10.1	10.1	23.5	-13.4
ENADID 1996/97									
Education									
< primary (primaria)	28.5	20.1	8.3	15.7	20.5	-4.8	26.2	20.3	5.9
completed primary	30.8	18.3	12.5	34.2	21.0	13.2	31.4	19.7	11.7
1-2 years lower secondary school (secundaria)	9.9	5.8	4.1	6.8	4.3	2.5	9.3	5.0	4.3
completed lower secondary school	23.6	23.5	0.1	35.3	27.7	7.6	25.6	25.7	0.0
any years in upper secondary (preparatoria)	7.3	32.3	-25.0	7.9	26.5	-18.5	7.4	29.3	-21.9
ENE 2001/02									
Education									
< primary (primaria)	21.1	15.4	5.7	18.4	15.7	2.7	20.8	15.7	5.1
completed primary	25.5	17.9	7.6	25.7	19.5	6.1	25.5	19.5	6.0
1-2 years lower secondary school (secundaria)	6.7	4.9	1.7	4.7	3.7	1.1	6.4	3.7	2.8
completed lower secondary school	27.2	23.5	3.7	27.1	22.7	4.4	27.2	22.7	4.5
any years in upper secondary (preparatoria)	19.5	38.2	-18.8	24.0	38.4	-14.4	20.1	38.4	-18.3
ENADID 2005/06									
Education									
< primary (primaria)	20.7	13.9	6.8	20.1	16.1	4.0	20.6	15.0	5.6
completed primary	23.4	15.1	8.4	21.8	16.5	5.3	23.1	15.8	7.4
1-2 years lower secondary school (secundaria)	7.2	4.9	2.2	5.5	4.0	1.5	6.9	4.5	2.4
completed lower secondary school	28.6	23.9	4.7	27.4	22.1	5.2	28.4	23.0	5.4
any years in upper secondary (preparatoria)	20.1	42.2	-22.1	25.2	41.3	-16.2	21.0	41.8	-20.8
ENADID 2008/09									
Education									
< primary (primaria)	16.9	10.8	6.1	14.0	11.1	2.8	16.3	11.0	5.4
completed primary	22.3	13.7	8.5	20.3	14.5	5.8	21.9	14.1	7.8
1-2 years lower secondary school (secundaria)	6.1	4.3	1.7	4.4	3.1	1.3	5.8	3.7	2.1
completed lower secondary school	31.0	24.5	6.5	30.1	24.0	6.1	30.8	24.2	6.6
any years in upper secondary (preparatoria)	23.8	46.6	-22.8	31.2	47.3	-16.1	25.2	47.0	-21.8

Notes:

Emigrant education is derived from multinomial logit coefficients predicting education given socio-demographic characteristics from the ENADID/ENE residents combined with migrant coefficients estimated from MxFLS 2002-2005 data from a model with the same socio-demographic characteristics (see text)

ENADID: National Survey of Demographic Dynamics

ENE: National Survey of Employment

MxFLS: Mexican Family Life Survey