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Abstract

We study the changes in intergenerational socioeconomic mobility in Mexico among cohorts born between the 1950s and the 1980s. These cohorts came of age in sharply different economic institutional contexts, as Mexico experienced urbanization, industrialization, and demographic transformations. In addition, we examine the role that educational attainment plays in the mobility process. Specifically, we examine the portion of the intergenerational socioeconomic association that is mediated by education, and the portion that occurs through channels other than the educational system. Given substantial stratification based on gender and region, we conduct separate analyses for Mexican men and women as well as across regions of the country.

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1. Introduction

Intergenerational mobility captures the association between parents' and their adult children's socioeconomic status. A strong association indicates that children's economic wellbeing is tightly determined by the advantages of birth. A weak association, instead, signals that opportunity to achieve economic wellbeing is open to everyone, regardless of their social origins. As such, intergenerational mobility provides information about equality of opportunity in society.

In order to evaluate the level of mobility in a particular society at a particular point in time, a useful strategy is to compare it to other nations. For example, the Great Gatsby curve evaluates the level of intergenerational mobility across several, mostly high-income, countries and shows substantial differences associated with economic inequality across countries (Corak 2013). An alternative is to examine mobility trends within a country over time and the association between changes in mobility and demographic, economic, and institutional changes in society.

This analysis uses the latter strategy. We study the changes in intergenerational socioeconomic mobility in Mexico among cohorts born between the 1950s and the 1980s. These cohorts came of age in sharply different economic institutional contexts, as Mexico experienced urbanization, industrialization, and demographic transformations. Changes in the economic context were marked by the transition from an import substituting industrialization model to a market-based system characterized by privatization and trade openness, two severe economic crises in the early 1980s and 1995, and limited economic growth thereafter. In the international context, Mexico is characterized by high levels of inequality, which rose after the debt crisis of the 1980s but have significantly declined since the late 1990s, driven by a decline in the economic returns to schooling and social programs targeted at the poor. These factors may have significantly altered the extent of intergenerational mobility across cohorts in Mexico.

In addition, we examine the role that educational attainment plays in the mobility process. Specifically, we examine the portion of the intergenerational socioeconomic association that is mediated by education, and the portion that occurs through channels other than the educational system. Given substantial stratification based on gender and region, we conduct separate analyses for Mexican men and women as well as across regions of the country.

This work proceeds as follows: Section 2 discusses theoretical approaches to change in intergenerational mobility over time. Section 3 offers a brief description of the Mexican demographic, economic, and institutional context and its change over the last few decades. Section 4 introduces the data and analytic strategy. Section 5 presents the results of the analysis and section 6 concludes.

2. Theoretical Approaches on the Change in Mobility over Time

Several theoretical approaches attempt to explain changes in intergenerational mobility over time. The classic “industrialization approach” that emerged in the post-war claims that mobility should increase as countries develop economically. Economic development would lead to the need for a better-educated, more specialized population, opening opportunities for educational enhancement. Modernization of institutions and values would lead to a shift from ascription to achievement as criterion for selection, and of universalism instead of particularism as a sorting mechanism in the educational system and the labor market. As a result, larger segments of the population would gain access to education, and their attainment would be increasingly less dependent on their background and more dependent on their own ability and merits (Kerr et al. 2011; Parsons 1970; Treiman 1970).

In contrast, the “constant fluidity” approach suggests very little change in mobility across place and time. This approach emerged from the empirical finding that intergenerational mobility - measured in terms of occupational class- did not change across cohorts born during the first half of the 20th century in Europe, in spite of massive economic development and institutional change. The findings, reported in the landmark volume “The Constant Flux” (Erikson and Goldthorpe 1992) brought to the fore the question about reasons for persistence in intergenerational class mobility in spite of substantial economic growth and institutional transformations.

In order to explain the persistence of mobility over time, researchers have pointed to strategies that more advantaged families could deploy to guarantee privilege for their children, particularly in terms of educational attainment. For example, the maximally maintained inequality (MMI) hypothesis argues that an expansion of the educational system that does not specifically focus on the less-advantaged classes provides new opportunities for all children and that advantaged children will benefit more (Raftery and Hout 1993). On average, children of advantaged classes have more economic and cultural resources, perform better in school, have higher aspirations, and are more acquainted with the educational system. In short, they are "better prepared than are others to take advantage of new educational opportunities" (Ayalon and Shavit 2004).

Furthermore, even if access to a particular educational level becomes universal, new sources of differentiation will emerge at this educational level based for example in school quality, school type (for example, private vs public schools), school track, field of study, etc., and the advantaged classes will be able to obtain educational credentials that provide them with enhanced opportunities for further attainment (see Lucas 2001 for the original formulation, see also Ayalon and Shavit 2004; Breen and Jonsson 2000).

The finding of “constant social fluidity” was revisited in a comparative analysis of class mobility trends in European countries between the 1970s and the 1990s (Breen 2004). This updated analysis finds more variation in mobility trends, with growing fluidity in some countries, but null or slight temporal change in others. While Britain, Israel and less conclusively Germany display “constant fluidity”; some indication of growing openness is detected in France, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, and Sweden (Breen and Luijkx 2004:54). Changes in Ireland and Italy are quite minor, and only the Netherlands displays a sustained increase in mobility over the entire period considered (Ganzeboom and Luijkx 2004).

Researchers also found a striking decline in mobility over time in the case of Russia after the market transformation of the early 1990s (Gerber and Hout 2004). As explained by the authors, “the market transition in Russia...altered so many fundamental economic institutions so rapidly that we can confidently ascribe changes in social mobility...to this source rather than to cultural change or industrialization” (Gerber and Hout 2004:678). Decreasing mobility is likely to have been driven by a tightening of the association between social origins and educational attainment in the late Soviet and post-Soviet periods (Gerber 2007; Gerber and Hout 1995).

The evidence about change in intergenerational mobility in Latin America and other late-developing countries is more limited. Intergenerational class mobility was found to remain constant in Chile across cohorts born between 1937 and 1970 in spite enormous economic and institutional transformations (Torche 2005). In China, social class mobility declined over time in context of market transformation –a trend similar to Russia. The increase in the intergenerational class association was driven by a strengthening of the hierarchical status barriers across classes (Zhou and Xie 2019). As the authors explain, the consolidation of the status hierarchy in context of market transformation in China emerged because market reform provided abundant opportunity

for advantaged classes to convert their political capital into material resources, and the abolition of egalitarian educational policies limited a critical channel of upward mobility for disadvantage families.

In contrast, class mobility was found to increase over time in both Brazil (Torche and Ribeiro 2010) and Korea (Chung and Park 2019), driven by declining returns to schooling in context of fast educational expansion. In the Brazilian context educational expansion resulted in a decline in the economic returns to schooling while in Korea educational expansion was associated with more equal access to education and the growing share of adults reaching post-secondary level, where the intergenerational association is weaker (Hout 1988; Torche 2011).

So far, this review has focused on intergenerational mobility measured in terms of occupational class. Another relevant measure of mobility uses income or earnings. Evidence of change over time in earnings or income mobility is scarce because of its tall data requirements. Analyzing trends in economic mobility cannot rely on retrospective information about parents provided by adult children and requires long-term panel or administrative data for individuals born over an extended period of time and their parents are needed to properly examine intergenerational economic mobility.

Given that, the analysis of trends in economic mobility is confined to the United States and a few other high-income countries. In the United States, the evidence about change in economic mobility over time is mixed and inconclusive, with findings from diverse datasets differing widely. Findings based on the Panel Study of Income Dynamics (PSID) show an increase in mobility among men born in the 1950s and 1970s, although this trend usually fails to reach statistical significance, due to the small sample sizes (Fertig 2003; Hertz 2007; Lee and Solon 2009; Mayer and Lopoo 2005). In sharp contrast, analysis based on the National Longitudinal Surveys (NLS)

show a decline in mobility between cohorts born in the late 1940s to early 1950s and those born in the early 1960s (Bloome and Western 2011; Levine and Mazumder 2002). Analysts have also used census data to address trends. Because the census does not permit matching parents with adult children, analysts create a “synthetic cohort” of parents, which is less than ideal. This analysis finds that the intergenerational income elasticity declined between 1950 and 1980 but then increased over the 1980s and 1990s (Aaronson and Mazumder 2008) mirroring the recent surge in income inequality in the United States.

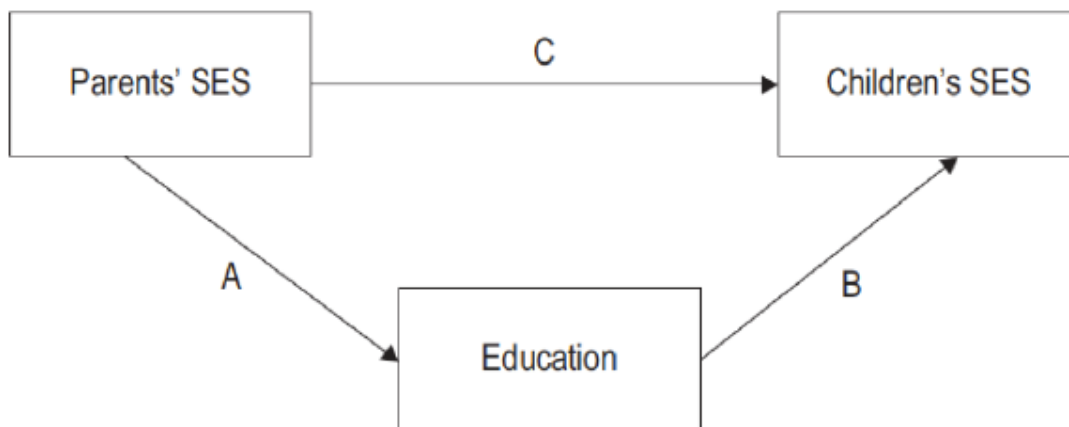
In contrast, recent analysis using tax records finds virtually no change in the intergenerational association across the cohorts born between the early 1970s and the early 1990s (Chetty et al. 2014). In sum, no clear answer emerges in terms of mobility trends in a context of growing inequality and a cautious answer would be one that suggests no substantial change over time. Before the Chetty et al. (2014) analysis, this inconclusiveness could have been attributed to data limitations. But the analysis using a large administrative dataset with little measurement error suggests stability over time may be an accurate finding.

Researchers have also examined the role that education plays in the change in intergenerational income persistence between cohorts born in the 1960s and 1980s in the US. The analysis finds several countervailing trends resulting in the persistence of mobility over time: The association between parental income and educational attainment and the economic returns to schooling have increased substantially over the last decades. These factors would, *ceteris paribus*, result in an increase in intergenerational persistence. However, two countervailing trends offset this increase: The expansion of higher education reduced the intergenerational association because completing college helps low-income children become high-income adults (Torche 2011), and

within educational groups parental income became less predictive of adult income. The net result is little change in mobility over time (Bloome, Dyer, and Zhou 2018).

Educational attainment and intergenerational mobility. The findings about the critical roles that educational attainment plays in the intergenerational mobility process in different national contexts highlight the importance of considering education as a mobility mechanism. A long tradition in sociology has established that education is both the main conduit for intergenerational persistence and the main vehicle for mobility (Blau and Duncan 1967; Hout and DiPrete 2006). This dual role, which puzzled researchers when it was first documented, is easy to explain. Education is a central vehicle for reproduction because advantaged parents are able to afford more and better schooling for their children, which in turn pays off in the labor market and other markets. Education is also the main vehicle for mobility because factors other than parental advantage account for most of the variance in educational attainment, thus weakening the link between socioeconomic origins and destinations.

Figure 1. The role of education in the intergenerational mobility process.



Based on this formulation, the overall socioeconomic association between parents and adult children can be decomposed into the pathway mediated by educational attainment and a

direct pathway that is net of education. The education pathway includes the association between parents' socioeconomic standing and individual educational attainment (“inequality of educational opportunity”), and the association between educational attainment and adult children's socioeconomic position (“economic returns to education”). These pathways are indicated by arrows A and B, respectively, in Figure 1. The former channel is probably the most amenable to policy intervention in the form of public investments in human capital (Solon 2004), and features of educational systems including tracking, standardization, and mandatory attainment (Kerckoff 1995; Van de Werfhorst and Mijs 2010). The direct pathway that is net of education captures multiple factors such as the direct inheritance of property, variation in the probability of marrying and assortative mating patterns by social origins, the use of family-based social networks or cultural capital for offspring's occupational placing, and the transmission of personality traits across generations among many others. It is indicated by arrow C in Figure 1. Change in any of these channels could alter overall mobility and will be the focus of our analysis.

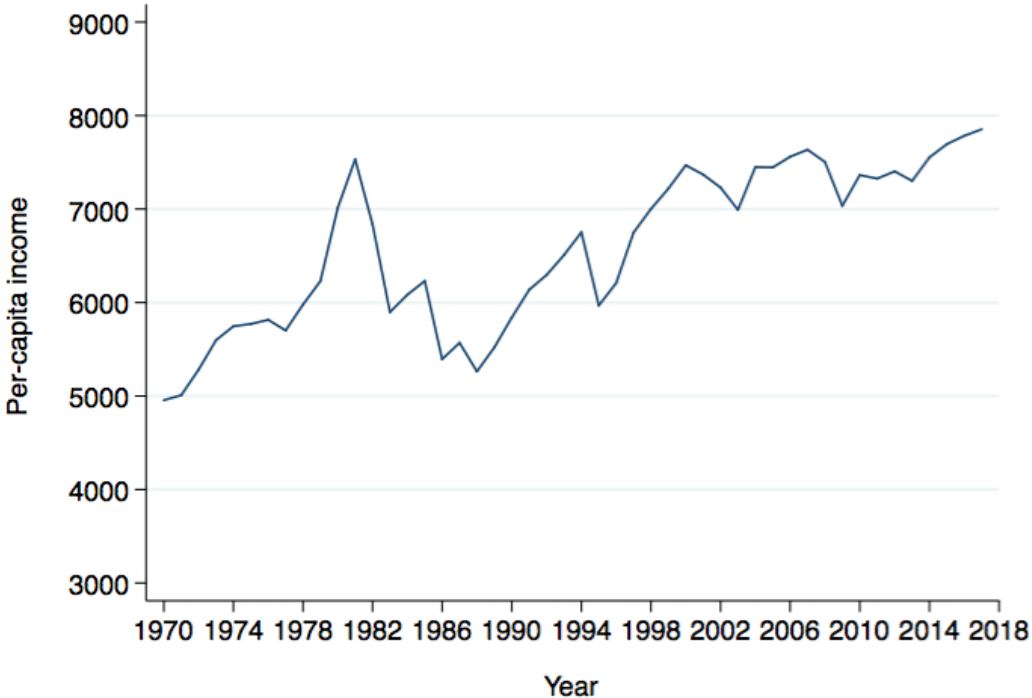
3. The Mexican Context

Mexico is a middle income country with a net per capita income of 7,853 2010 US dollars. This is similar to the Latin American average of \$7,489, and much lower than the high income countries average of 35,278 (World Bank 2019). Mexico has experienced substantial urbanization and economic transformation since the mid 20th century. Between 1960 and 2010, the urban population increased from 50.7% to 77.8% of the total population (INEGI 2019) y employment in the services sector expanded from less than 30% to more than 60% in the same period (Cota-Yañez and Navarro-Alvarado 2015). Between 1940 and 1970 Mexico benefitted from substantial economic growth based on an income substitution industrialization (ISI) strategy, led by the state and with

an economy relatively isolated from international trade. Economic growth during that period was so substantial, that it was dubbed “the Mexican miracle” Middlebrook and Zepeda (Middlebrook and Zepeda 2003).

The ISI model started to show limitations in the 1970s when external debt increased dramatically (Lustig 1998; Middlebrook 1995). In 1982 Mexico declared a moratorium on its foreign debt and experienced a severe economic crisis, followed by partial recovery and significant economic fluctuation, with a new currency devaluation crisis in 1995. The country recovered from the 1995 crisis quickly but failed to experience significant growth since then (Boltvinik 2003; Salas and Zepeda 2003). Figure 2 displays the real per-capita national income from 1950 to 2017 and shows substantial declines in 1982 and 1995, followed by partial stagnation thereafter.

Figure 2. Real income per capita in Mexico 1970-2017 (2010 US dollars).



Source: <https://data.worldbank.org/indicator/NY.ADJ.NNTY.PC.KD>

In context of the debt crisis and under pressure from international financial institutions, Mexican authorities implemented a package of market-based economic reforms. The reforms included trade liberalization, deregulation of financial markets and foreign investment, and aggressive privatization of state-owned companies (Stallings and Peres 2000:40–42). The transformation was rapid and extensive. By 1993, only 2010 of the 1,155 state companies that existed in the 1980s continued to exist and were not in private hands (Teichman 1996). In 1994 the North America Free Trade Agreement (NAFTA) with the US and Canada went into effect, establishing the largest free trade area in the world (Esquivel, Lustig, and Scott 2010). By 2000 Mexico had become the main exporter of manufactured goods in Latin America (Middlebrook and Zepeda 2003).

Economic instability and market reforms resulted in a decline in real wages and an increase in poverty and, over the short-term, inequality. Some studies suggest that the substantial reduction in poverty enjoyed by Mexico between 1950 and 1980 came to a halt in the 1980s, and that poverty increased after the 1995 crisis (Boltvinik 2003; Szekely 2005). Income inequality increased between the early 1980s and the early 1990s. However, inequality has declined substantially since the mid-1990s and more impressively in the 2000s (Esquivel et al. 2010). As in most Latin American countries during that period, this decline in inequality has been driven by a drop in the economic premium to education in context of sharp educational expansion and strengthened public transfers.

Mexico has experienced substantial educational expansion since the 1960s, in particular at the primary and lower secondary levels. Expansion was fostered by government programs. In the 1960s, the Mexican government started to implement expansion reforms at the primary and lower-

secondary levels, starting with the 11-year plan (1959–1975) and later with the Education for Everyone program (1976–1992) (Creighton and Park 2010; Post 2001).

Educational expansion declined during the 1980s debt crisis due to the combined effect of declining household's income and declining public educational expenditures (Binder 1999; Binder and Woodruff 2002:249–67; Reimers 1991:319–53). The halt in educational expansion during the 1980s was most pronounced at the post-secondary level, which may have induced scarcity of skilled workers accounting at least partially for growing inequality during that decade and until the early 1990s (Legovini, Buillon, and Lustig 2005). In the late 1980s educational expenditures increased and was redirected from tertiary to primary and secondary levels. One of the consequences of the reallocation of expenditures toward lower educational levels was the expansion of schools in areas where they did not exist before. Combined with robust conditional cash transfer programs such as Progresa/Oportunidades, these policies resulted in educational upgrading of the Mexican population (Esquivel et al. 2010).

Regional differences. Mexico features wide disparities across regions in terms of infrastructure, educational attainment, and economic vulnerability and wellbeing (Rodríguez-Oreggia 2005), with the Southern region of the country lagging significantly behind. These disparities have widened in the recent past (Moy 2018), and raise the question about different opportunities for mobility across regions.

4. Data and Analytic Strategy

The main objective of this analysis is to examine the change in intergenerational socioeconomic mobility in the recent decades in Mexico, considering variation across gender and region of the country. This analysis relies on three nationally representative social mobility surveys undertaken

by the Mexican Centro de Estudios Espinosa Yglesias in 2006, 2011, and 2017 (ESRU-EMOVI 2006, ESRU-EMOVI 2011, and ESRU-EMOVI 2017).

The ESRU-EMOVI surveys are based on probabilistic nationally and regionally representative sample of noninstitutionalized Mexican men and women 25–64 years of age. Respondents are randomly selected household members within the age range, regardless of their relationship with the head of the household (except for year 2006, in which only heads of household were selected into the sample). The survey uses a multistage stratified sampling design. Primary sampling units (PSUs) are localities stratified by population size, SSU are Basic Geostatistical Areas (AGEBs) and were selected in urban areas only and were stratified by socioeconomic indicators, and final sampling units are households.

The surveys includes information on respondents' demographic characteristics, education, employment and occupation, income, and assets and evaluation of their socioeconomic circumstances, with a consistent core of questions across years. They also collect retrospective information about family structure, education, occupation, and assets of the parents of respondents. The total sample sizes were 7,288 households in 2006, 10,752 in 2011, and 17,655 in 2017. Sampling weights were constructed to bring sample distribution in accordance with the population by estimating the inverse of the probability of selecting each household into the survey and were used in all analyses.

We restrict the analytic sample men and women 27-62 years old at the time of the interview who are heads of household or spouses/partners of the head of household. We establish a lower threshold of 27 years of age to assure that the vast majority of respondents have attained “occupational maturity” and an upper threshold of 62 years old to ensure that most of them (or their spouses/partners) are engaged in the labor market. We focus on heads and spouses/partners

rather than all adult household members in order to make sure that our measure of socioeconomic wellbeing pertains to the respondents (see below). We note that in the 2006 ESRU-EMOVI the women included in the analytic sample are not a representative of all Mexican women and that they overrepresent female heads of household.

Analytic strategy. While sociological analysis of mobility examines class and occupational status, economists focus on earnings and, more recently, total family income (Chetty et al. 2014; Lee and Solon 2009; Mayer and Lopoo 2005). In contrast to earnings, total family income includes extra-occupational resources, such as financial assets and private and public transfers, and some important family-level dynamics, such as spousal selection (assortative mating), intra-household division of labor, and union formation and dissolution.

This article uses an alternative perspective to capture family-level socioeconomic standing of parents and children. It examines intergenerational mobility directly at the household level rather than attempting to choose or combine individual-level class positions, earnings, or income. This approach is based on the assumption that household members share resources and divide their labor in order to maximize collective welfare, and that household's well-being is the result of endogenous decision-making and different contributions by its members. This assumption does not mean that household arrangements are free from gender-based power dynamics and inequality. It means, however, that a direct measure of household well-being may provide a better indicator than the aggregation of individual-level resources.

Specifically, we construct an index of economic well-being by combining durable goods, assets, and services owned by the family. A growing literature in social sciences and development studies uses such indexes, particularly in context where monetary data for parents and children are not available (Ferguson et al. 2003; Filmer and Pritchett. 1999; Filmer and Pritchett 2001;

McKenzie 2005; Sahn and Stifel 2003). In spite of widespread use, the interpretation of the concept captured by the indexes varies, even when researchers use similar indicators and analytical strategies. For example, Filmer and Pritchett (1999, 2001) indicate that the index captures household wealth, which they then interpret as a proxy for long-run economic status or expenditures, McKenzie (2005) refers to living standards, Ferguson et al. (2003) mention permanent income, and Sahn and Stifel (2003) speak of well-being (see Wai-Poi, Spilerman and Torche (2008) for a review of this literature).

Our interpretation of the index of economic well-being is based on the distinction among three concepts associated with living standards—income, wealth, and consumption. Income captures a flow of pecuniary resources that can be subject to high short-term variability. Wealth is a stock of financial and real assets minus liabilities owned by the family. Consumption is level of material comfort the family can afford, expressed in goods owned and services used. Because the economic index is based on such goods and services rather than financial or real stocks of wealth, we see it as primarily associated with levels of daily material comfort most directly corresponding with household consumption level. We assume that the household's ability to sustain a particular level of consumption is the outcome of the family's occupational and extra-occupational resources, access to credit, and public and private transfers, that is, of all sources of family income. While income captures the inputs that support a certain consumption level, the economic well-being index provides a measure of the consumption itself.

One important concern for mobility researchers is whether the measure of economic wellbeing captures permanent standing purged of short-term fluctuations. This concern is based on the permanent income theory, which assumes that household consumption at any point in time is determined not just by current income but by expectations about income in future years, taxes,

price increases, and other long-term considerations (Friedman 1957). Mobility researchers use different approaches to address this concern. Studies of economic mobility produce multi-year averages of earnings or income centered around age 40 to approach such permanent measure (Black and Devereux 2011). Analyses of class mobility rely on the assumption that class position does not change much after individuals reach “occupational maturity” in their mid-30s (Goldthorpe 1980; Heath and Payne 1999). The index of economic well-being provides a plausibly closer measure of permanent income insofar as it directly captures the level of material comfort that families are able to maintain.

A principal component analysis is used to create the index of economic wellbeing. Principal component analysis is a technique that distinguishes different dimensions (“components”) accounting for the common variance across items included. We use the first component as a latent measure of socioeconomic status, the linear combination that accounts for the largest proportion of variance that is common to all items. This strategy produces empirical weights for each indicator based on the strength of its correlation with other indicators instead of assigning equal weights (as obtained by a simple count of indicators owned by the family), or using any other arbitrary weighting strategy (Filmer and Pritchett 1999; McKenzie 2005). As a result, items that are weakly correlated with others are given small weight, bypassing the need to arbitrarily eliminate items. Furthermore, the use of a measure based on the covariance across items disregards idiosyncratic determinants of each item’s ownership—for example, a preference for bicycles that is not correlated to economic constraints or the use of air conditioning in extremely warm regions.

One important concern about the principal component methodology is the ability of the index to discriminate across the entire socioeconomic structure in the context being analyzed,

including the lower and upper ends. This is achieved by including items that distinguish access to resources among the poor (for example in the Mexican context, access to pumped water and refrigerator), as well as among the wealthy (for example, ownership of computer or use of domestic service). Based on our examination of the data, a practical advantage of using a set of household goods and services is that respondents' reports about these items have good recall properties and elicit low refusal rates when compared with survey questions about income/earnings and even occupation.

Our index of economic wellbeing for adult respondents was based on the following indicators, available in all three surveys: personal computer, stove, washing machine, refrigerator, cellular phone, landline phone, internet access, inside toilet, electricity, domestic service, cable or satellite TV, shop or business, land or farm, second residence, animals, agricultural machinery or equipment, savings account, checking account, credit card, and cars. A similar strategy was used to evaluate the socioeconomic standing of the parents' household when the respondent was 14 years old, including the following variables: TV, inside toilet, stove, second home, savings account, piped water, phone (either landline or cellphone), domestic service, agricultural machinery or equipment, farm or land, electricity, checking account, car, business or shop, animals. Information about these variables was retrospectively provided by the respondent. (An alternative version of the index including the respondent's and parents' occupational status yields similar results, but results in a selected sample as it includes only those respondents who have/have had a paid occupation).

We measured change in mobility over time by examining trends across birth cohorts. We distinguish eight five-year birth cohorts, as follows: Mexicans born between 1950 and 1954, 1955-59, 1960-64, 1965-69, 1970-74, 1975-79, 1980-84, and 1985-89. The availability of three surveys

obtained at different points in time allows us to measure the mobility experience of different cohort at different stages of their life-cycles. Specifically, all cohorts except for three are observed at the three time points, two cohorts are observed at two time points, and the most recent cohort born between 1985 and 1989 is observed during one period (Figure 3).

Figure 3. Lexis Diagram, Distribution across periods, cohorts and age groups in Mexico.

Cohort / Year	2006	2011	2017
1950-54	52-56	57-61	X
1955-59	47-51	52-56	58-62
1960-64	42-46	47-51	53-57
1965-69	37-41	42-46	48-52
1970-74	32-36	37-41	43-47
1975-79	27-31	32-36	38-42
1980-84	X	27-31	33-37
1985-89	X	X	28-32

Note: Groups in cells identify age groups.

As it is well-known, there is a perfect linear relationship between the age, cohort, and period (measured as survey year) dimensions of time (Glenn 2003). Our focus is change across birth cohorts, restricted to a life cycle stage in which these birth cohorts have reached “occupational maturity”. We operationalize survey year as a set of dummies, and age and birth cohort as continuous variables using a quadratic formulation. The quadratic formulation breaks the perfect linear relationship between variables while providing a flexible approach that accommodates non-linear change.

5. Findings

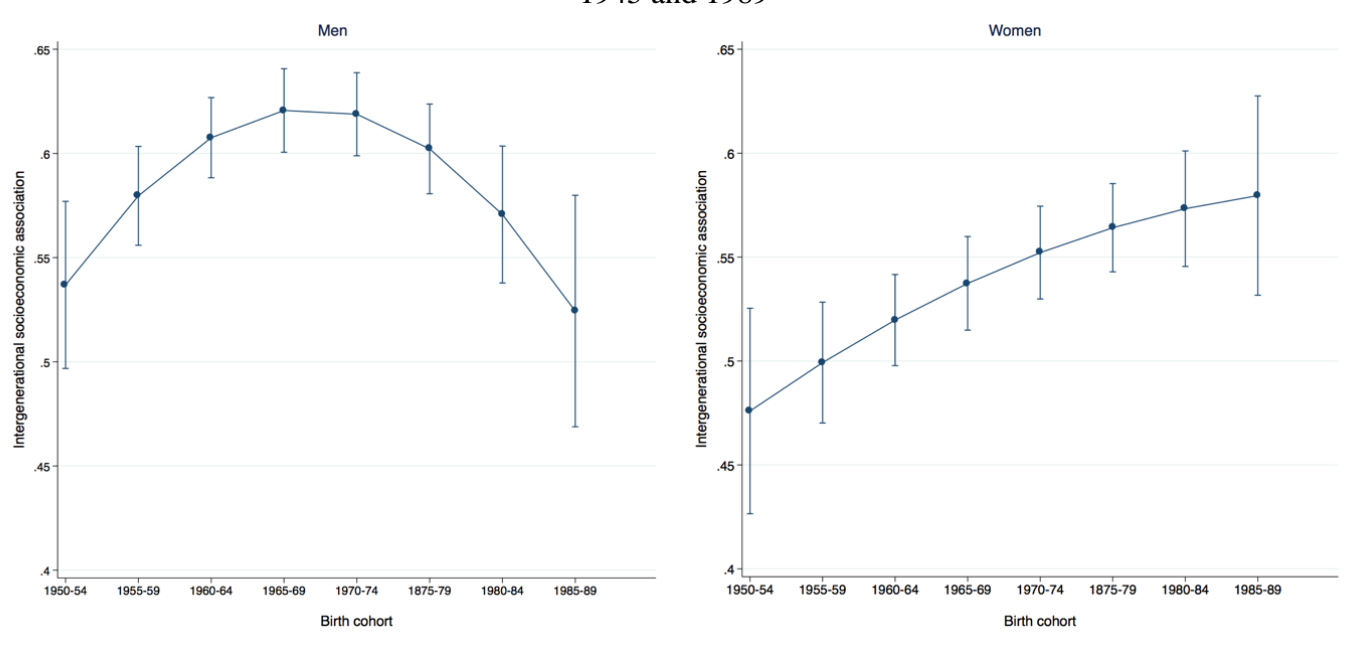
The first component of the analysis examines trends in intergenerational socioeconomic mobility across cohorts born between 1945 and 1989. The analysis of mobility is based on linear regression

models in which socioeconomic status (SES) of adult children is regressed on parents' socioeconomic status (SES). The parameter estimate associated with parents' SES captures the extent of intergenerational association, with larger values indicating less mobility. In order to capture change in mobility across cohorts, we model birth cohort as a continuous variable (1=1950/54 birth cohort,..., 8=1985/89 birth cohort) and add a linear and quadratic version of cohort membership. These linear and quadratic terms are interacted with parental SES in order to capture change in the intergenerational socioeconomic mobility across cohorts (with the possibility of the change being nonlinear). The models further control for respondents' age using a quadratic formulation, and for survey year using a set of dummy variables. The models are separately estimated for men and women.

Figure 4 reports the focal parameter estimates from this model: Those capturing the change in the intergenerational socioeconomic association across cohorts. As shown in the left panel of figure 4, among men, the intergenerational socioeconomic association increases from cohorts born in the early 1950s (cohort 1) to those born in the early 1970s (cohort 5) to then decline up to the most recent cohort born between 1985 and 1989.

Given that these changes are net from any effects associated with age and survey year, we can interpret them as trends in mobility across cohorts in contemporary Mexican society. The change in mobility among Mexican men is remarkable. The intergenerational association increased from .54 in cohort 1 to .62 in cohort 5 –signaling declining mobility– and then returned to .53 among the youngest cohort.

Figure 4. Change across cohorts in the intergenerational socioeconomic persistence among Mexican men and women born between 1945 and 1989



Mobility trends vary substantially by gender. Among women (Figure 4, left panel) the intergenerational socioeconomic association increases monotonically and significantly from .48 among women born between 1950 and 1955 to .58 among women born 1985 and 1989, surpassing men’s intergenerational association among the youngest cohort (although the gender difference is not statistically significant). The comparison between genders is striking: Among cohorts born after 1970, intergenerational mobility has increased among men but declined among women. (Appendix 1 replicates the analysis for women excluding the non-representative sample of women in ESRU-EMOVI 2006. Results are substantively identical to those including the women sample in 2006, showing a decline in mobility across cohorts).

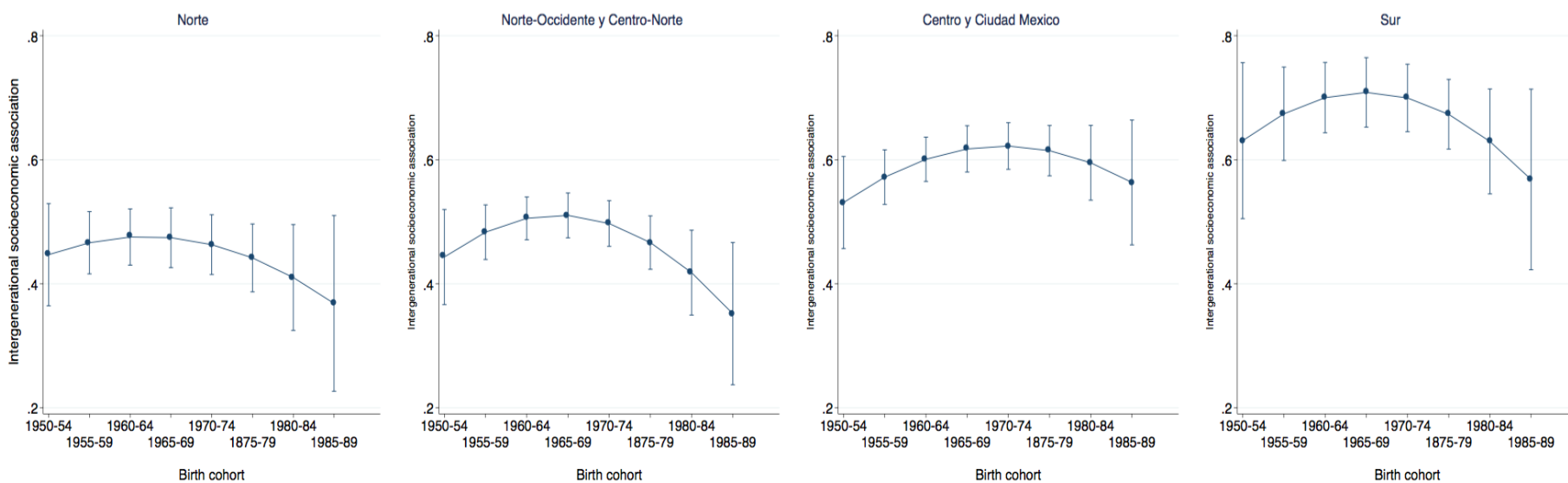
Before we examine the potential drivers of the change in mobility over time, in particular the role of education, it is interesting to evaluate regional variation in mobility trends. We conduct a stratified analysis by region of residence at age 14, distinguishing the following four regions: North (Baja California, Coahuila, Chihuahua, Nuevo León, Sonora, Tamaulipas), North-West and Center-North (Baja California Sur, Durango, Nayarit, Sinaloa, Zacatecas, Aguascalientes, Colima, Jalisco, Michoacán, San Luis Potosí), Center and Mexico City (Guanajuato, Hidalgo, México, Morelos, Puebla, Querétaro, Tlaxcala and the Federal District) and South (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán).

Figures 5 and 6 show trends in mobility across cohorts among men and women, respectively. The first striking finding is that the intergenerational association is stronger -i.e. mobility is more limited- in the Southern region of the country, a finding aligned with prior research (Torche 2019). This finding emerges from both Mexican men and women. Even though the differences across regions fail to reach significance in some pairwise comparison, the magnitude of the differences is substantial.

The mobility trends are similar across regions for both men and women: In all regions, the inverted-U trend in intergenerational persistence emerges for men and a monotonic increase in persistence is observed for women. The consistency across regions is striking and suggests that mobility patterns are largely driven by national-level contextual factors rather than idiosyncratic circumstances at the regional level. A partial exception emerges for women. As shown in Figure 6, there is a marked decline in mobility in the Northern and Southern regions of the country, compared to a pattern closer to stability in mobility in the other regions. The trend in the Southern region is particularly worrisome given that the level of poverty is highest in this region. A growing intergenerational association in this region, reaching 0.7 among the youngest cohort of women in

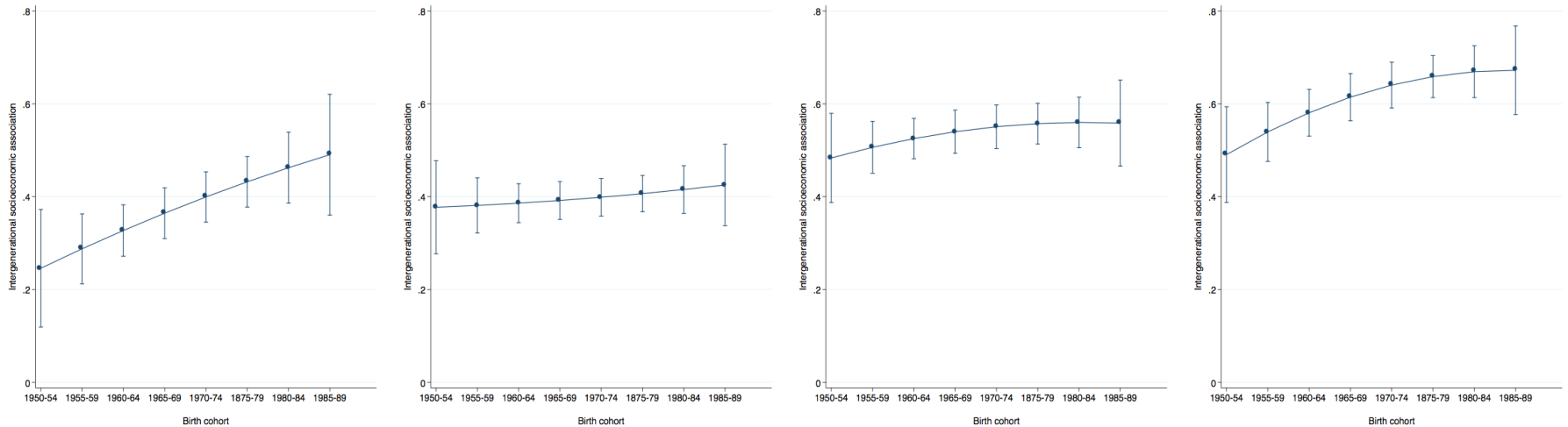
the South means Mexican women who grew up in the Southern region of the country are increasingly likely to follow in their in most cases deprived– parents’ footsteps.

Figure 5. Change across cohorts in the intergenerational socioeconomic persistence by region. Mexican men born between 1945 and 1989



Regions of birth. Norte (Baja California, Coahuila, Chihuahua, Nuevo León, Sonora, Tamaulipas), Norte-Occidente y Centro Norte (Baja California Sur, Durango, Nayarit, Sinaloa, Zacatecas, Aguascalientes, Colima, Jalisco, Michoacán, San Luis Potosí), Centro y Ciudad de Mexico (Guanajuato, Hidalgo, México, Morelos, Puebla, Querétaro, Tlaxcala, Ciudad de Mexico) Sur (Campeche, Chiapas, Guerrero, Oaxaca, Quitana Roo, Tabasco, Veracruz, and Yucatán.). Region of residence measured when respondents were 14 years old.

Figure 6. Change across cohorts in the intergenerational socioeconomic persistence by region. Mexican women born between 1945 and 1989

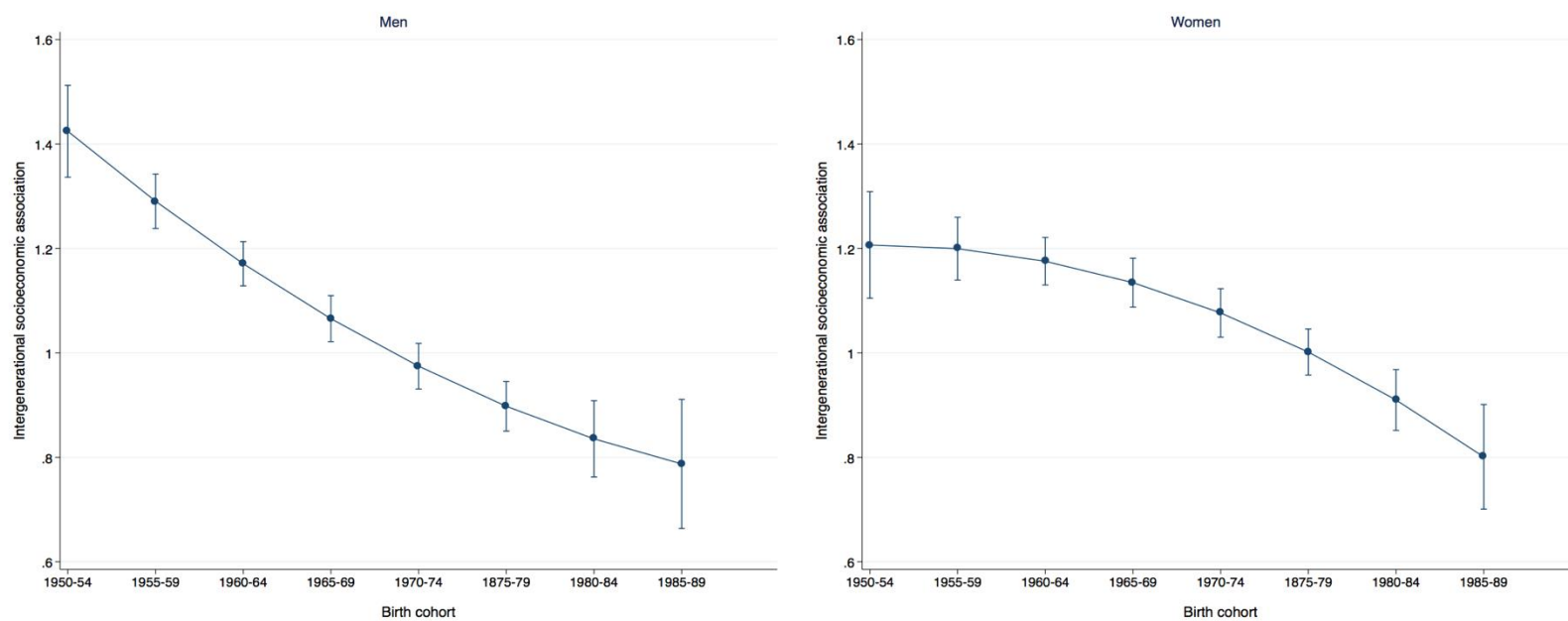


Regions of birth. Norte (Baja California, Coahuila, Chihuahua, Nuevo León, Sonora, Tamaulipas), Norte-Occidente y Centro Norte (Baja California Sur, Durango, Nayarit, Sinaloa, Zacatecas, Aguascalientes, Colima, Jalisco, Michoacán, San Luis Potosí), Centro y Ciudad de Mexico (Guanajuato, Hidalgo, México, Morelos, Puebla, Querétaro, Tlaxcala, Ciudad de Mexico) Sur (Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.).

Education and change in mobility over time in Mexico. As discussed in section 2, education could provide a central mechanism for the persistence of advantage across generations. In particular, if the association between parents' socioeconomic resources and respondent's educational attainment increases over time (pathway A in figure 1), or if the socioeconomic returns to schooling grow over time (pathway B in figure 1), this would result in an increase in the intergenerational socioeconomic association.

Additionally, if the intergenerational socioeconomic association net of education changes over time (pathway C in figure 1), this mechanism will also result in reduced mobility.

Figure 7. Change across cohorts in the association between parents' SES and children's educational attainment. Mexican men and women born between 1945 and 1989



Educational attainment measured as total number of years of completed schooling.

The next set of analyses examines the role of education in the change in mobility over time. Figure 7 examines the first pathway of influence, namely changes in the association between parents' socioeconomic status (SES) and adult children's educational attainment, measured as total number of years of schooling.

Figure 7 shows that the inequality in educational attainment based on parental socioeconomic resources has declined greatly across cohorts in Mexico. In the case of men, each one-unit increase in the parents' socioeconomic status is associated with an increase of 1.4 years in son's schooling among those born between 1950 and 1954. Given that the standard deviation of parents' SES is 2.2, this means that about half of a standard deviation increase in parents' SES results in 1.4 additional year of schooling. The influence of parents' socioeconomic status dropped to only .8 years of schooling for each one-unit increase in parents' socioeconomic status among men born in the late 1980s.

The decline in educational inequality is smaller but still pronounced for women. Among women born between 1950 and 1954 about half a standard deviation increase in parents' SES resulted in a gain of 1.2 years of schooling on average among adult daughters. In contrast, among women in the youngest cohort born between 1985 and 1989, the payoff was only .8 years of schooling.

Given that the association between parents' socioeconomic status and children's educational attainment declined substantially across cohorts for both men and women, this pathway cannot account for the inverted-U shaped trend in the intergenerational socioeconomic association among men, nor can it account for the increase in the intergenerational socioeconomic association among women. We then explore the second possible pathway, namely changes in the

socioeconomic returns to schooling, measured as the association between years of schooling attained and socioeconomic wellbeing among adult children.

Figure 8 shows that the socioeconomic returns to schooling have increased substantially and by a similar magnitude across cohorts for Mexican men and women. Higher levels of schooling pays off more in terms of economic wellbeing among those born between 1985 and 1989 than it did for those in earlier cohorts. It is relevant to point out that this trend does not fully match with the declining wage returns to education since the 1990s (Esquivel et al. 2010). There is no reason to expect the returns to education in terms of wage and socioeconomic status to follow similar trends, however. Firstly, our measure of socioeconomic status measures economic wellbeing at the household rather than individual level and thus includes determinants of wellbeing other than wage and dynamics such as assortative mating. Secondly, wage returns to schooling provide a period measure captured for the entire adult population at a certain point in time. In contrast, our analysis of trends over time focuses on change across cohorts.

The increase in socioeconomic returns to schooling can account for declining mobility among women but cannot explain the increase and then decline in intergenerational association among men (inverted-U trend over time). We now turn to the last component of the intergenerational socioeconomic association, namely the portion of the intergenerational association that is net of educational attainment, capturing a diverse range of channels such as the direct inheritance of property, variation in the probability of marrying and assortative mating patterns by social origins, the use of family-based social networks or cultural capital for occupational placing, and the transmission of personality traits, among many others.

Figure 8. Change across cohorts in the socioeconomic returns to schooling among Mexican men and women born between 1950 and 1989

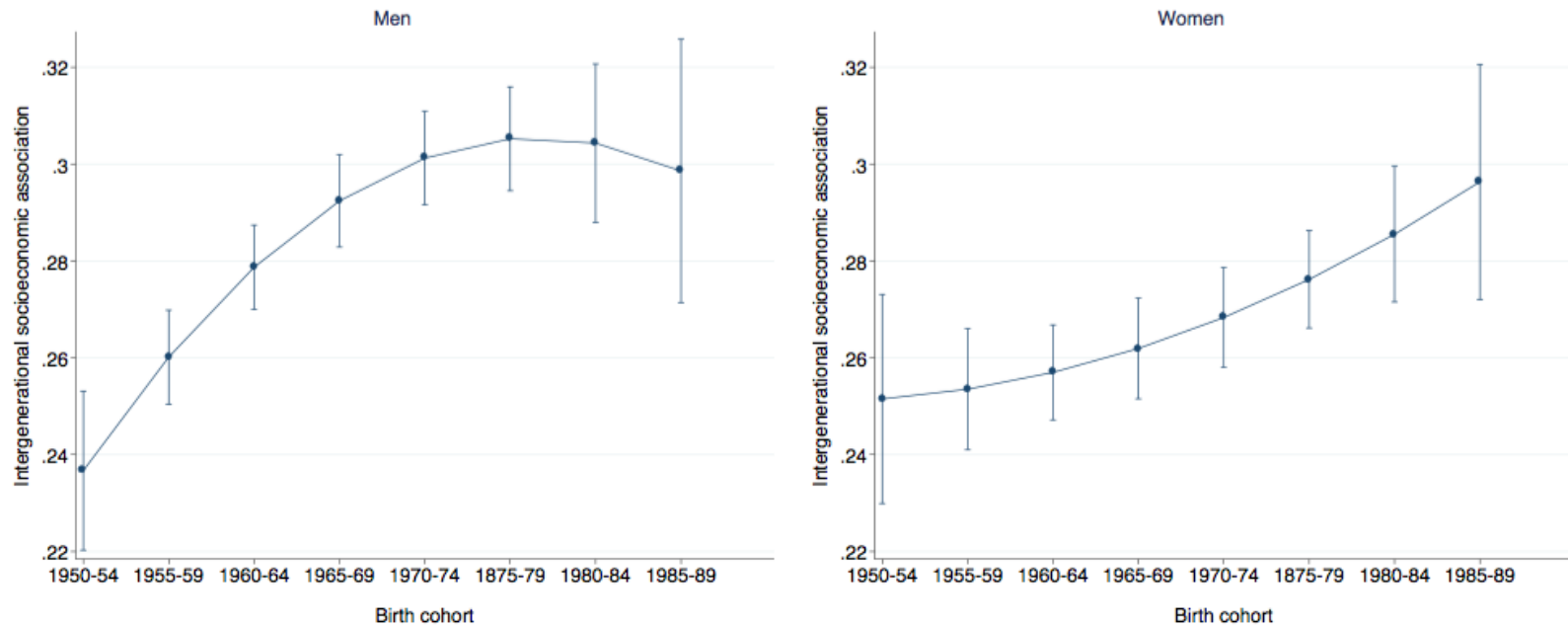


Figure 9 shows an inverted U-shaped trend in the intergenerational socioeconomic association that is net of educational attainment among men. The net intergenerational socioeconomic association increases from cohorts born between 1950 and the early 1970s, and declines among cohorts born thereafter, in a pattern identical to the trend in overall socioeconomic mobility (Figure 4, left panel). In contrast, the net association increases monotonically across cohorts for women. For both men and women, these trends are in fact identical to changes in the overall intergenerational mobility, suggesting that they drive changes in mobility in Mexico. By comparing aggregate mobility trends across cohorts (Figure 4) with mobility trends controlling for educational attainment (Figure 9) for

men and women we can assess the proportion of the intergenerational association that is accounted for by adult children's educational attainment.

Figure 9. Change across cohorts in intergenerational socioeconomic association net of education. Mexican men and women born between 1945 and 1989

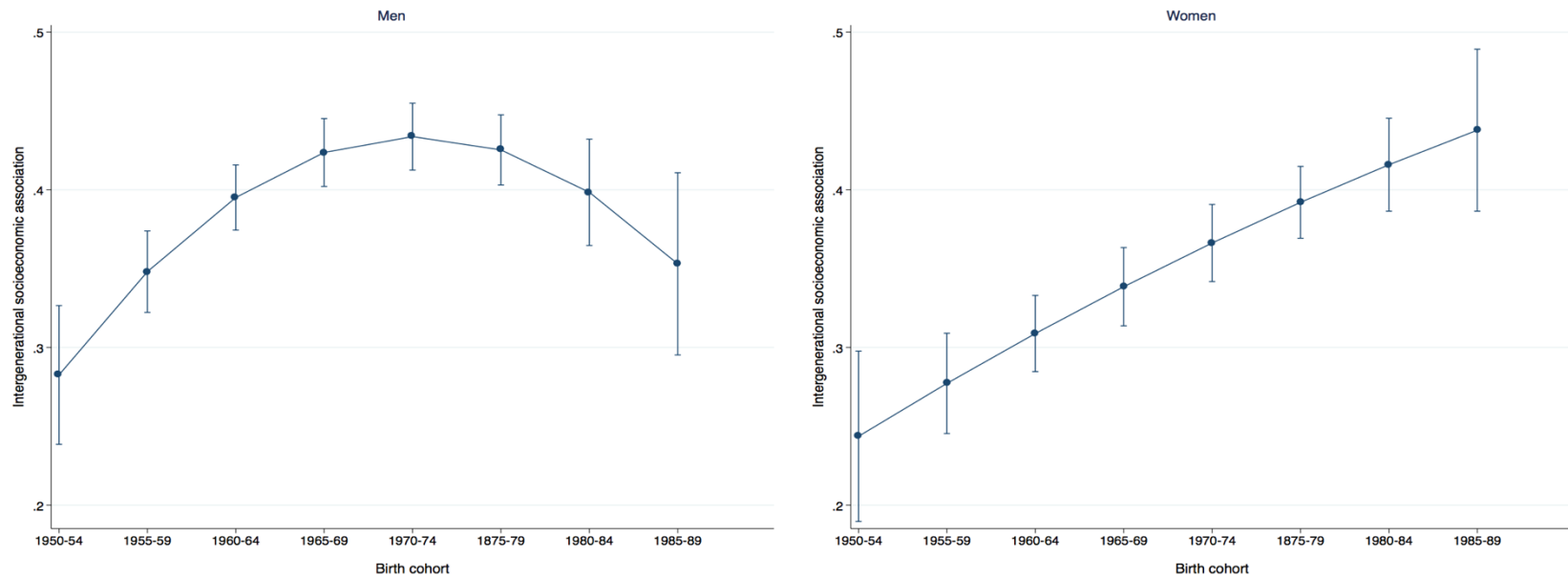
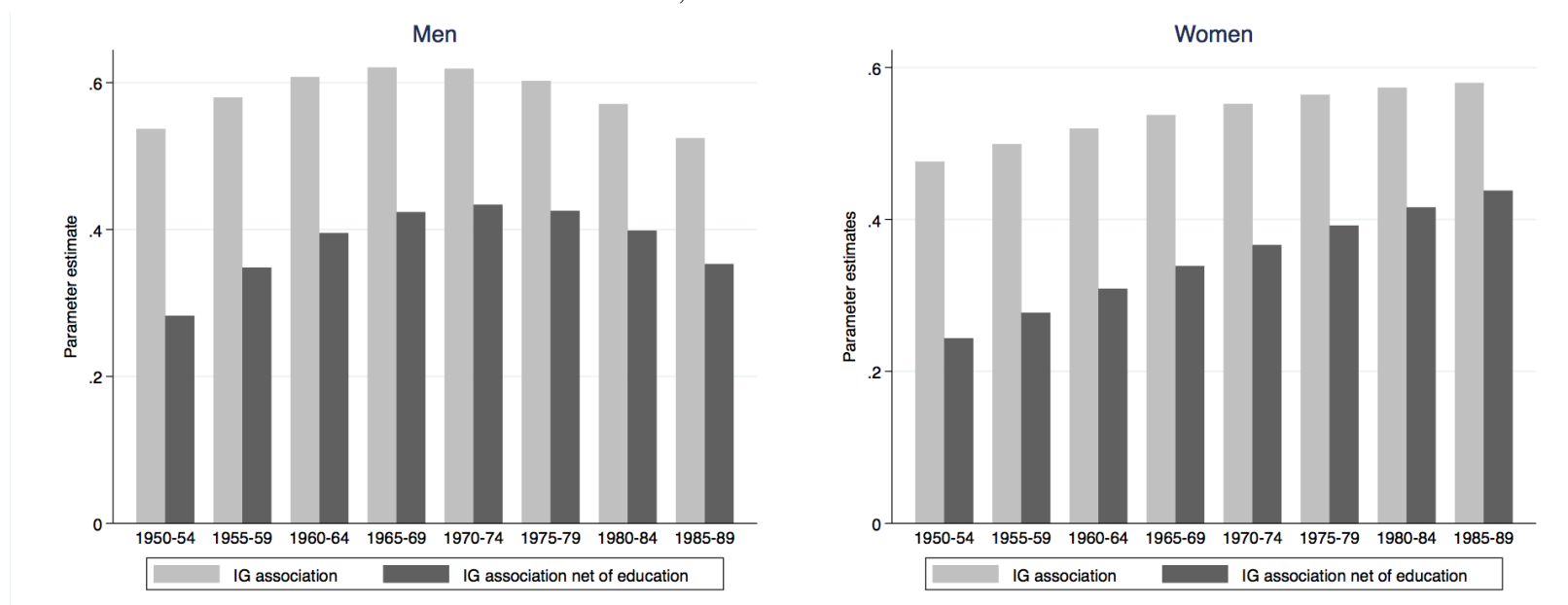


Figure 10 shows the decline in the intergenerational association once educational attainment is accounted for, across cohorts. For men, the decline ranges between 30 percent and 47 percent across cohorts. Education plays a stronger role (resulting in a larger decline) among older cohorts. For women, the decline ranges from 25 percent to 49 percent. As for men, the mediating role of education declines across cohorts, suggesting extra-educational factors play an increasingly relevant role in the intergenerational persistence of socioeconomic advantage.

Figure 10. Overall intergenerational socioeconomic association and intergenerational socioeconomic association controlling for educational attainment across cohorts, Mexican men and women born between 1945 and 1989



Conclusions

Overall, this analysis provide important information about change in mobility in Mexico. Among Mexican men, the intergenerational economic association increases across cohorts from those born between the 1950s to those born in the early 1970s, to then decline to among younger cohorts. The analysis of the role of education presented in figures 7-9 shows that this trend is largely driven by changes in the intergenerational association that are net of education, combined by offsetting trends in the mechanisms involving education: A decline in the association between parents' resources and education attainment, but an increase in the association between schooling and socioeconomic wellbeing. In the case of women, the increase in the intergenerational socioeconomic association across cohorts -signaling declining mobility- is driven by a combination of growing socioeconomic returns to schooling and growing intergenerational association net of education.

The good news from this analysis is that both men and women have experience substantial equalization in their access to educational attainment: Across cohorts, how much education individuals are able to attain is increasingly detached from their social origins. The bad news is that mobility has not increased substantially among Mexican men and has declined among Mexican women. In fact, it wasn't for the equalizing trend in the association between social origins and educational attainment, the decline in mobility among women would be even more pronounced. The substantial equalization of access to educational attainment, as remarkable as it is, has not been sufficient to induce an increase in mobility in Mexican society.

The differences by gender are notable: Among Mexican men, mobility declined and then increased across cohorts. Among women, a monotonic decline in mobility is observed, driven by the portion of the intergenerational association that is net of education. What can explain these

differences? It is possible that changing patterns in assortative mating based on social origins have exacerbated the intergenerational persistence of advantage among women. Alternatively, it is possible that over time, Mexican parents have altered their criteria for allocation of resources between sons and daughters so that they more likely to pass their assets to daughters (or not to pass any assets if they are poor).

References

- Aaronson, Daniel and Bhashkar Mazumder. 2008. "Intergenerational Economic Mobility in the United States, 1940 to 2000." *Journal of Human Resources* 43(1):139–72.
- Ayalon, Hanna and Yossi Shavit. 2004. "Educational Reforms and Inequalities in Israel: The MMI Hypothesis Revisited." *Sociology of Education* 77(2):103–20.
- Binder, Melissa. 1999. "Schooling Indicators during Mexico's 'Lost Decade.'" *Economics of Education Review* 18(2):183–99.
- Binder, Melissa and Christopher Woodruff. 2002. "Inequality and Intergenerational Mobility in Schooling: The Case of Mexico." *Economic Development and Cultural Change* 50(2):249–67.
- Black, Sandra E. and Paul J. Devereux. 2011. "Recent Developments in Intergenerational Mobility." Pp. 1487–1541 in *Handbook of Labor Economics*. Vol. 4, edited by D. Card and O. Ashenfelter. Elsevier B.V.
- Blau, Peter and Otis Dudley Duncan. 1967. *The American Occupational Structure*. New York: John Wiley & Sons.
- Bloome, Deirdre, Shauna Dyer, and Xiang Zhou. 2018. "Educational Inequality, Educational Expansion, and Intergenerational Income Persistence in the United States." *American Sociological Review* 83(6):1215–53.
- Bloome, Deirdre and Bruce Western. 2011. "Cohort Change and Racial Differences in Educational and Income Mobility." *Social Forces* 90(2):375–95.
- Boltvinik, Julio. 2003. "Welfare, Inequality, and Poverty in Mexico, 1970–2000." in *Confronting Development. Assessing Mexico's Economic and Social Policy Change*, edited by K. Middlebrook and E. Zepeda. Stanford: Stanford University Press.
- Breen, Richard. 2004. *Social Mobility in Europe*. Oxford: Oxford University Press.
- Breen, Richard and Jan Jonsson. 2000. "Analyzing Educational Careers: A Multinomial Transition Model." *American Sociological Review* 65:754–72.
- Breen, Richard and Ruud Luijkx. 2004. "Social Mobility in Europe between 1970 and 2000." in *Social Mobility in Europe*. Oxford: Oxford University Press.
- Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States." *Quarterly Journal of Economics* 129(4):1553–1623.
- Chung, Inkwan and Hyunjoon Park. 2019. "Educational Expansion and Trends in Intergenerational Social Mobility among Korean Men." *Social Science Research* 83:102307.
- Corak, Miles. 2013. "Inequality from Generation to Generation: The United States in Comparison." Pp. 107–23 in *The Economics of Inequality, Poverty, and Discrimination in the 21st century*, edited by R. Rycorft. Santa Barbara CA: ABC-CLIO.
- Cota-Yañez, Rosario and Alberto Navarro-Alvarado. 2015. "Análisis Del Mercado Laboral y El Empleo Informal Mexicano." *Papeles de Poblacion* 21(85):211–49.
- Creighton, Mathew and Hyunjoon Park. 2010. "Closing the Gender Gap: Six Decades of Reform in Mexican Education." *Comparative Education Review* 54(4):513–37.
- Erikson, Robert and John Goldthorpe. 1992. *The Constant Flux*. Oxford: Oxford University Press.
- Esquivel, Gerardo, Nora Lustig, and John Scott. 2010. "Mexico: A Decade of Falling Inequality: Market Forces or State Action?" Pp. 175–217 in *Declining Inequality in Latin America*, edited by L. F. Lopez-Calva and N. Lustig. Brookings/UNDP.
- Ferguson, B. D., A. Tandon, E. Gakidou, and C. J. L. Murray. 2003. "Estimating Permanent

- Income Using Indicator Variables.” Pp. 747–60 in *Health System Performance Assessment: Debates, Methods, and Empiricism*, edited by C. Murray and D. Evans. Geneva: World Health Organization.
- Fertig, Angela. 2003. “Trends in Inter-Generational Occupational Mobility in the United States.” *Journal of Income Distribution* 12(3):108–130.
- Filmer, D. and L. Pritchett. 1999. “The Effect of Household Wealth on Educational Attainment: Evidence from 35 Countries.” *Population and Development Review* 25(1):85-120.
- Filmer, Deon and Lant Pritchett. 2001. “Estimating Wealth Effects without Expenditure Data-or Tears: An Application to Educational Enrollments in States of India.” *Demography* 38(1):115–32.
- Friedman, Milton. 1957. “The Permanent Income Hypothesis.” Pp. 20–37 in *A Theory of the Consumption Function*. NBER.
- Ganzeboom, Harry and Ruud Luijkx. 2004. “Recent Trends in Intergenerational Occupational Class Reproduction in the Netherlands 1970–99.” in *Social Mobility in Europe*, edited by R. Breen. Oxford: Oxford University Press.
- Gerber, Theodore. 2007. “Russia: Stratification in Postsecondary Education since the Second World War.” Pp. 294–320 in *Stratification in Higher Education*, edited by Y. Shavit, R. Arum, and A. Gamoran. Stanford University Press.
- Gerber, Theodore and Michael Hout. 1995. “Educational Stratification in Russia during the Soviet Period.” *American Journal of Sociology* 101(3):611–60.
- Gerber, Theodore P. and Michael Hout. 2004. “Tightening up: Declining Class Mobility during Russia’s Market Transition.” *American Sociological Review* 69(5):677–703.
- Glenn, Norval. 2003. “Distinguishing Age, Period, and Cohort Effects.” Pp. 465–76 in *Handbook of the Life Course*, edited by J. Mortimer and M. Shanahan. Springer.
- Goldthorpe, John. 1980. *Social Mobility and Class Structure in Modern Britain*. Oxford: Clarendon Press.
- Heath, Anthony and Clive Payne. 1999. *Twentieth Century Trends in Social Mobility in Britain*. Working Paper 70 CREST. National Centre for Social Research and Department of Sociology University of Oxford, Oxford, UK.
- Hertz, Tom. 2007. “Trends in the Intergenerational Elasticity of Family Income in the United States.” *Industrial Relations* 46(1):22–50.
- Hout, Michael. 1988. “More Universalism, Less Structural Mobility: The American Occupational Structure in the 1980s.” *American Journal of Sociology* 93(6):1358–1400.
- Hout, Michael and Thomas A. DiPrete. 2006. “What We Have Learned: RC28’s Contributions to Knowledge about Social Stratification.” *Research in Social Stratification and Mobility* 24(1):1–20.
- INEGI. 2019. “Mexico: Poblacion Urbana y Rural.”
- Kerckhoff, Alan. 1995. “Institutional Arrangements and Stratification Processes in Industrial Societies.” *Annual Review of Sociology* 21:323–47.
- Kerr, David, Deborah Capaldi, Lee Owen, Margit Wiesner, and Katherine Pears. 2011. “Changes in At-Risk American Men’s Crime and Substance Use Trajectories Following Fatherhood.” *Journal of Marriage and the Family* 73(5):1101–16.
- Lee, Chul-In and Gary Solon. 2009. “Trends in Intergenerational Income Mobility.” *Review of Economics and Statistics* 91(4):766–72.
- Legovini, Arianna, Cesar Buillon, and Nora Lustig. 2005. “Can Education Explain Changes in Income Inequality in Mexico.” Pp. 275–312 in *The Microeconomics of Income Distribution*

- Dynamics*, edited by F. Bourguignon, F. Ferreira, and N. Lustig. World Bank/Oxford University Press.
- Levine, David and Bhashkar Mazumder. 2002. *Choosing the Right Parents: Changes in the Intergenerational Transmission of Inequality between 1980 and the Early 1990s*. . Federal Reserve Bank of Chicago Working Paper 2002-08, Chicago, IL. . Federal Reserve Bank of Chicago Working Paper 2002-08, Chicago, IL.
- Lucas, Samuel R. 2001. “Effectively Maintained Inequality: Education Transitions, Track Mobility, and Social Background Effects.” *American Journal of Sociology* 106(6):1642–90.
- Lustig, Nora. 1998. *Mexico: The Remaking of An Economy*. Washington, D.C.: Brookings Institution Press.
- Mayer, Susan and Leonard Lopoo. 2005. “Has the Intergenerational Transmission of Economic Status Changed?” *Journal of Human Resources* 40(1):169–85.
- McKenzie, David J. 2005. “Measuring Inequality with Asset Indicators.” *Journal of Population Economics* 18(2):229–60.
- Middlebrook, K. 1995. *The Paradox of Revolution. Labor, the State and Authoritarianism in Mexico*. Baltimore: Johns Hopkins University Press.
- Middlebrook, K. and E. Zepeda. 2003. “On the Political Economy of Mexican Development Policy.” in *Confronting Development. Assessing Mexico’s Economic and Social Policy Change*, edited by K. Middlebrook and E. Zepeda. Stanford: Stanford University Press.
- Moy, Valeria. 2018. “Desigualdad : La Herencia Regional.” *Nexos* 1–16.
- Parsons, Talcott. 1970. “Equality and Inequality in Modern Society, or Social Stratification Revisited.” in *Social Stratification: Research and Theory for the 1970s*, edited by E. Lauman. Indianapolis: Bobbs-Merrill.
- Post, David. 2001. “Region, Poverty, Sibship and Gender Inequality in Mexican Education: Will Targeted Welfare Policy Make a Difference for Girls?” *Gender and Society* 15(3):468–89.
- Raftery, Adrian and Michael Hout. 1993. “Maximally Maintained Inequality: Expansion, Reform, and Opportunity in Irish Education 1921-75.” *Sociology of Education* 66(1):41–62.
- Reimers, Fernando. 1991. “The Impact of Economic Stabilization and Adjustment on Education in Latin America.” *Comparative Education Review* 35(2):319–53.
- Rodríguez-Oreggia, Eduardo. 2005. “Regional Disparities and Determinants of Growth in Mexico.” *Annals of Regional Science* 39(2):207–20.
- Sahn, David and David Stifel. 2003. “Exploring Alternative Measures of Welfare in the Absence of Expenditure Data.” *Review of Income and Wealth* 49(4):463–89.
- Salas, C. and E. Zepeda. 2003. “Employment and Wages: Enduring the Costs of Liberalization and Economic Reform.” in *Confronting Development. Assessing Mexico’s Economic and Social Policy Change*, edited by K. Middlebrook and E. Zepeda. Stanford: Stanford University Press.
- Solon, Gary. 2004. “A Model of Intergenerational Mobility Variation over Time and Place.” Pp. 38–47 in *Generational income mobility in North America and Europe*, edited by M. Corak. Cambridge: Cambridge University Press.
- Stallings, B. and W. Peres. 2000. *Growth, Employment and Equity*. Washington, D.C.: Brookings Institution Press.
- Szekely, Miguel. 2005. *Pobreza y Desigualdad En México Entre 1950 y El 2004*. Secretaría de Desarrollo Social Mexico, Serie Documentos de Investigación, núm. 24.
- Teichman, J. 1996. *Privatization and Political Change in Mexico*. Pittsburgh: Pittsburgh University Press.

- Torche, Florencia. 2005. "Unequal but Fluid: Social Mobility in Chile in Comparative Perspective." *American Sociological Review* 70:422–50.
- Torche, Florencia. 2011. "Is a College Degree Still the Great Equalizer? Intergenerational Mobility across Levels of Schooling in the United States." *American Journal of Sociology* 117(3):763–807.
- Torche, Florencia. 2019. *Mobility and Gender in Mexico: A Regional Perspective*. Department of Sociology, Stanford University.
- Torche, Florencia and Carlos Costa Ribeiro. 2010. "Pathways of Change in Social Mobility: Industrialization, Education and Growing Fluidity in Brazil." *Research in Social Stratification and Mobility* 28(3):291–307.
- Treiman, Donald. 1970. "Industrialization and Social Stratification." in *Social Stratification: Research and Theory for the 1970s*, edited by E. Lauman. Indianapolis: Bobbs-Merrill.
- Wai-Poi, Matthew, Seymour Spilerman, and Florencia Torche. 2008. *Economic Well-Being: Concepts and Measurement with Asset Data*. Department of Economics, Columbia University.
- Van de Werfhorst, Herman and Jonathan Mijs. 2010. "Achievement Inequality and the Institutional Structure of Educational Systems: A Comparative Perspective." *Annual Review of Sociology* 36(1):407–28.
- World Bank. 2019. "Adjusted Net National Income Per-Capita by Country." Retrieved October 8, 2019 (<https://data.worldbank.org/indicator/NY.ADJ.NNTY.PC.KD>).
- Zhou, Xiang and Yu Xie. 2019. "Market Transition, Industrialization, and Social Mobility Trends in Postrevolution China." *American Journal of Sociology* 124(6):1810–47.

Appendix 1. Change across cohorts in the intergenerational socioeconomic persistence among Mexican men and women born between 1945 and 1989 without 2006 women sample

