

Adam Chang
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Employment opportunities as a driver of migration in Mexico

Introduction

As we studied in class, migration can be understood as an investment under the labor/human capital models, in which the direct costs of moving are compared to the present value of long-run benefits, which typically come from higher wages. The factors involved in this decision are largely systematic—based on the direct costs of moving, the baseline wages in the origin and destination, the returns to human capital in the origin and destination, and the variances of all of these factors. This allows us to hypothesize and then estimate certain patterns of mobility, in which types of workers are moving, and where they come from and go to.

We center this study on Mexico, which historically has seen significant employment-related migration, both internally and to the United States. From the period after WWII until 2010, for example, Mexico City and its outlying suburbs in Mexico state added nearly 18 million residents¹; Mexican migration to the United States for employment is a well-studied phenomenon, with 13 million immigrants of Mexican origin comprising the U.S. population by 2007². These trends reflect that labor-related reasons often drive migration in Mexico.

Literature Review

Since 1982, Douglas S. Massey and Jorge Durand from the *Universidad de Guadalajara* have studied Mexican migration to the United States, extensively surveying the characteristics

¹ <https://www.newgeography.com/content/004177-the-evolving-urban-form-suburbanizing-mexico>

² <https://www.pewresearch.org/hispanic/2015/11/19/more-mexicans-leaving-than-coming-to-the-u-s/>

and behaviors of migrants to the United States. In a 2004 book reflecting on their research³, Durand and Massey assert that one of their main contributions has been to fight the “common perception in the United States...that Mexican immigrants are fleeing dire, impoverished circumstances at home” (6). Durand and Massey argue that migration is used by households as a “rational” strategy alongside “missing and failed markets in Mexico, conditions that are common in a country undergoing transition to a developed, market society”; very pointedly, they cite migration as a consequence of Mexico’s “dynamic growth and development, not its poverty” (6). This lends our investment-based understanding of migration more credence in the Mexican setting, in highlighting that migration is very much a consequence of individuals’ and households’ strategic economic decisions and not something out of desperation, as common perceptions may indicate.

Empirical Strategy

Data Source

We use the *Encuesta Nacional sobre Niveles de Vida de los Hogares*, or Mexican Family Life Survey (MXFLS), from *Universidad Iberoamericana* and *Centro de Investigación y Docencia Económicas* in collaboration with Duke University. MXFLS started in 2002 as a longitudinal survey “representative of the Mexican population at the national, urban, rural, and regional level” that involved 35,000 individuals from 8,400 households⁴. Specific to migration, the MXFLS includes significant sections that survey individuals’ personal migration history, in both permanent and temporary migration. Questions regarding permanent migration center on

³ Durand, Jorge, and Douglas S. Massey, eds. *Crossing the Border: Research from the Mexican Migration Project*. Russell Sage Foundation, 2004.

⁴ <http://www.ennvih-mxfls.org/english/introduccion.html>

previous residences, time spent there, and reasons for moving (for example, there is the very specific question “Which was the labor reason why you went to [...]?” with answers including work availability, higher pay, better job, and company transfer). MXFLS also asks individuals if they’ve thought about moving in the future, and for what reasons. In terms of temporary migration (defined as travel in the previous two years for between one and twelve months), MXFLS surveys the reasons for moving and places moved to.

Migration

We consider various classifications of whether individuals are “migrants.”

- Desire to migrate: MXFLS asks individuals “Have you thought about moving in the future, outside the locality/community where you currently live?”. Individuals who answer affirmatively are asked why, with “Related with work/to improve the standards of live [*sic*]” by far the most popular option (in the initial survey, 2151/3375 or 63.7% of those reporting a desire to migrate). We code individuals as 1 for reported desire to migrate if they reported thinking about migration *and* chose work as the reason.
- Previous temporary migration: respondents are asked if they previously migrated temporarily (as defined above), and for what reason. We code individuals as 1 if they answered “Related to labor of themselves”; there are 417 such individuals.
- Previous permanent migration: we code individuals as 1 if, at least once in the past, they have made permanent changes of residence because of their own job (2635 individuals).

Education

The MXFLS surveys individuals’ education history across a variety of measures beyond just formal schooling level. As such, there are a number of ways to construct a right-hand-side variable for individuals’ human capital and skills.

- Highest level of schooling attended: options on the MXFLS range from “without instruction” “high school,” “normal basic” (post-secondary training for teachers), “college,” and “graduate.” We mark individuals as high school attendees if they attended at least high school—23.6% (4,670 / 19,757) of respondents—and college attendees if they attended a level above high school, which was 9.6% (1,904 / 19,757) of respondents.
- Years of schooling completed: the MXFLS doesn’t ask this, but asks respondents’ ages when they started primary school and when they left school (or if they are still in school). We construct a measure for years of schooling completed as the difference between the age when an individual left school (or their current age, if they are still in school) and the age when they started primary school. [Nearly all respondents (98.2% or 17352 / 17670) knew the age when they started primary school, with a mean of 6.64. 2,252 respondents are still in school. Of the remaining 15,408 respondents, almost all (14,933 / 15,408, or 96.9%) know the month/year they left school or how old they were when they did so. For those who don’t know when they started/quit school, we construct an “imputed” years of schooling measure, using the population mean(s). We show this has no effect on results.]
- Technical/commercial education: MXFLS asks about, separate from formal education, what we might consider job training. 13.5% of individuals (2,378 / 17,670) answer “yes.”

Demographics

- Gender: Durand and Massey wrote that most Mexican migrants, especially undocumented migrants to the United States, are young males (6). We hypothesize that it’s easier for males to migrate, especially with security problems in much of Mexico.
- Indigenous origin: 2,446 of 19,756 (12.4%) respondents report being part of an indigenous ethnic group. This is the only question asked by MXFLS on race and

ethnicity. We may imagine that being from an indigenous ethnic group significantly affects one's labor market outcomes, as it does in the United States, though it's not what the independent effect of indigenous origin is on migration decisions.

- Marriage and household size: 12,411 of 19,748 respondents report being currently married or in “concubinato” (what would be a common-law marriage in the U.S.). We may imagine that marital ties and household size affect both labor market outcomes and migration decisions (the relation with the latter is unclear, since migration means separation from one's family but also higher income with which to support one's family).
- Originating region: we include state fixed effects for individuals, since individuals' states affect their initial labor market outcomes, and perhaps their migration decisions (for example, some states are farther from destination hotspots, like Mexico City).
- Age: with migration as an investment decision, age affects the expected return.

Specification

We frame migration as an investment decision in the following sense. Put the origin locale wage structure as $w_0 = \alpha_0 + \beta_0 X + \varepsilon_0$ and the destination's as $w_1 = \alpha_1 + \beta_1 X + \varepsilon_1$. Then individuals migrate if $w_1 - w_0 = (\alpha_1 - \alpha_0) + (\beta_1 - \beta_0)X$ is greater than the migration cost. We assume that higher baseline wages are correlated with higher returns to education; the migration decision, then, should be positively correlated with individuals' educational backgrounds, since more educated individuals can likely find higher wage gains. This gives us:

$$P(\text{migration}_{ij}) = \Phi(\beta_0 + \beta * \text{education}_i + \alpha * \text{demographics}_i + \delta_j + \varepsilon_{ij})$$

Here, δ_j are state fixed effects, and we use a variety of demographic controls, as detailed prior.

Results

(* is significance at 5% and ** at 1%. All regressions either with constant or state fixed effects.)

Probit regressions on **desire** to migrate because of labor (self) – 2002 Dataset

	(A1)	(A2)	(A3)	(A4)	(A5)	(A6)
HS	0.3027** (0.037)	0.3010** (0.037)	0.2272** (0.048)	0.2169** (0.049)		
College			0.1586* (0.063)	0.1767** (0.064)		
Technical					0.3089** (0.042)	0.3147** (0.043)
Male	0.2951** (0.031)	0.2997** (0.032)	0.2937** (0.031)	0.2980** (0.032)	0.3315** (0.031)	0.3365** (0.031)
Age	-0.0242** (0.001)	-0.0247** (0.001)	-0.0245** (0.001)	-0.0251** (0.001)	-0.0249** (0.001)	-0.0255** (0.001)
Married	-0.2098** (0.041)	-0.1947** (0.041)	-0.2124** (0.041)	-0.1971** (0.041)	-0.2058** (0.041)	-0.1896** (0.041)
Indigenous	-0.0385 (0.049)	-0.0309 (0.052)	-0.0399 (0.049)	-0.0310 (0.052)	-0.0468 (0.049)	-0.0389 (0.052)
HH Size	-0.0072 (0.008)	-0.0095 (0.008)	-0.0065 (0.008)	-0.0088 (0.008)	-0.0100 (0.008)	-0.0124 (0.008)
State Fixed FX		•		•		•
n	14,956	14,956	14,956	14,956	14,956	14,956
R²	0.074	0.088	0.075	0.089	0.073	0.087

	(A7)	(A8)	(A9)	(A10)	(A11)	(A12)
HS	0.1664** (0.049)	0.1546** (0.050)				
College	0.1960** (0.064)	0.2162** (0.065)				
Technical	0.2654** (0.043)	0.2757** (0.044)				
Years of Education			0.0204** (0.002)	0.0210** (0.002)		
Years Ed. (imputed)					0.0212** (0.002)	0.0216** (0.002)
Male	Omitted in results for simplicity and brevity. But all regressions were run using these controls, with similar results as above.					
Age						
Married						
Indigenous						
HH Size						
State Fixed FX		•		•		•
n	14,956	14,956	12,088	12,088	14,956	14,956
R²	0.079	0.093	0.060	0.075	0.075	0.089

Probit regressions on **temporary** migration because of labor (self) – 2002 Dataset

	(B1)	(B2)	(B3)	(B4)	(B5)	(B6)
HS	0.0211 (0.071)	0.0212 (0.073)	0.0379 (0.090)	0.0196 (0.092)		
College			-0.0368 (0.124)	0.0036 (0.128)		
Technical					-0.1228 (0.098)	-0.1349 (0.0101)
Male	0.9686** (0.075)	0.9931** (0.077)	0.9687** (0.075)	0.9931** (0.077)	0.9700** (0.075)	0.9948** (0.077)
Age	-0.0199** (0.002)	-0.0203** (0.002)	-0.0198** (0.002)	-0.0203** (0.002)	-0.0202** (0.002)	-0.0206** (0.002)
Married	-0.3305** (0.074)	-0.2982** (0.076)	-0.3301** (0.074)	-0.2983** (0.076)	-0.3297** (0.074)	-0.2970** (0.076)
Indigenous	0.2204** (0.079)	0.2851** (0.088)	0.2207** (0.079)	0.2851** (0.088)	0.2147** (0.078)	0.2773** (0.087)
HH Size	-0.0143 (0.014)	-0.0176 (0.014)	-0.0145 (0.014)	-0.0176 (0.014)	-0.0162 (0.014)	-0.0193 (0.014)
State Fixed Effects		•		•		•
n	14,972	14,972	14,972	14,972	14,972	14,972
R²	0.1319	0.1545	0.1319	0.1545	0.1325	0.1553

	(B7)	(B8)	(B9)	(B10)	(B11)	(B12)
HS	0.0646 (0.092)	0.0475 (0.095)				
College	-0.0528 (0.125)	-0.0144 (0.129)				
Technical	-0.1365 (0.100)	-0.1458 (0.103)				
Years of Education			0.0055 (0.005)	0.0070 (0.005)		
Years Ed. (imputed)					0.0053 (0.005)	0.0062 (0.005)
Male	Omitted in results for simplicity and brevity. But all regressions were run using these controls, with similar results as above.					
Age						
Married						
Indigenous						
HH Size						
State Fixed Effects		•		•		•
n	14,972	14,972	12,103	12,103	14,972	14,972
R²	0.1328	0.1554	0.1221	0.1498	0.1324	0.1552

Probit regressions on **permanent** migration because of labor (self) – 2002 Dataset

	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
HS	0.1234** (0.037)	0.0987** (0.037)	-0.0440 (0.052)	-0.0901 (0.053)		
College			0.3033** (0.065)	0.3436** (0.066)		
Technical					0.0753 (0.044)	0.0459 (0.044)
Male	0.7003** (0.028)	0.7089** (0.029)	0.7013** (0.028)	0.7101** (0.029)	0.7118** (0.028)	0.7179** (0.029)
Age	0.0057** (0.001)	0.0059** (0.001)	0.0053** (0.001)	0.0054** (0.001)	0.0053** (0.001)	0.0055** (0.001)
Married	-0.1668** (0.035)	-0.1480** (0.036)	-0.1710** (0.035)	-0.1526** (0.036)	-0.1658** (0.035)	-0.1470** (0.036)
Indigenous	-0.2437** (0.045)	-0.2187** (0.048)	-0.2463** (0.045)	-0.2199** (0.048)	-0.2497** (0.045)	-0.2247 (0.048)
HH Size	-0.0179** (0.007)	-0.0154* (0.007)	-0.0172* (0.007)	-0.0147* (0.007)	-0.0196** (0.007)	-0.0168* (0.007)
State Fixed Effects		•		•		•
n	14,956	14,956	14,956	14,956	14,956	14,956
R²	0.072	0.086	0.074	0.089	0.072	0.086

	(C7)	(C8)	(C9)	(C10)	(C11)	(C12)
HS	-0.0611 (0.054)	-0.1012 (0.054)				
College	0.3139** (0.066)	0.3504** (0.066)				
Technical	0.0709 (0.045)	0.486 (0.045)				
Years of Education			0.0090** (0.002)	0.0083** (0.002)		
Years Ed. (imputed)					0.0070** (0.002)	0.0061** (0.002)
Male	Omitted in results for simplicity and brevity. But all regressions were run using these controls, with similar results as above.					
Age						
Married						
Indigenous						
HH Size						
State Fixed Effects		•		•		•
n	14,956	14,956	12,088	12,088	14,956	14,956
R²	0.075	0.089	0.070	0.081	0.072	0.086

Probit marginal effects on **desire** to migrate because of labor (self) – 2002 Dataset

	(A1)	(A2)	(A3)	(A4)	(A5)	(A6)
HS	0.0440**	0.0432**	0.0330**	0.0311**		
College			0.0230*	0.0253**		
Technical					0.0450**	0.0452**
State Fixed FX		•		•		•

	(A7)	(A8)	(A9)	(A10)	(A11)	(A12)
HS	0.0241**	0.0220**				
College	0.0283**	0.0308**				
Technical	0.0384**	0.0392**				
Years of Education			0.0032**	0.0033**		
Years Ed. (imputed)					0.0031**	0.0031**
State Fixed FX		•		•		•

(We do not show marginal effects for **temporary** migration because of labor (self) – 2002 Dataset, because there were no significant results on education coefficients.)

Probit marginal effects on **permanent** migration because of labor (self) – 2002 Dataset

	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
HS	0.0236**	0.0186**	-0.0084	-0.0169		
College			0.0578**	0.0645**		
Technical					0.0144	0.0087
State Fixed FX		•		•		•

	(C7)	(C8)	(C9)	(C10)	(C11)	(C12)
HS	-0.0116	-0.0190				
College	0.0598**	0.0658**				
Technical	0.0135	0.0091				
Years of Education			0.0017**	0.0016**		
Years Ed. (imputed)					0.0013**	0.0011**
State Fixed FX		•		•		•

In the regressions with **desire** to migrate, the education regressors follow the patterns we would expect, all with significance at the 1% level. Regressed together, the marginal effects of HS attendance, college attendance, and technical attendance are around +2%, +3%, and +4%

respectively. Each year of education has a marginal effect of around +0.3%. These education regressors are less significant in the regression with previous **permanent** migration; college stands out as still significant (with around +6% marginal effect), as does years of education (+0.15% marginal effect). In the regressions with previous **temporary** migration, none of the education regressors are significant.

Across all regressions, the “male” and “married” controls were significant at the 1% level, with “male” drastically increasing probability of migration/desire, and “married” strongly decreasing this probability (around +4% and -3% marginal effects in the “desire” regressions; but +13% and -3% in the actual permanent migration regressions, and +3%/-1% in the temporary regressions). Age generally had a -0.02 coefficient in the **desire/temporary** migration regressions, and a counterintuitive +0.005 coefficient in the **permanent** migration regressions.

Indigenous origin made it more likely that respondents had previously migrated **temporarily** (+1% marginal FX) yet less likely that respondents had previously migrated **permanently** (-4%). Larger household size was associated with less migration/desire, but this was significant only in the **permanent** migration regressions.

Discussion

We begin by emphasizing that these regressions measured drastically different indicators as their endogenous/dependent variables, with important consequences for the results. Age had a strong negative coefficient in the **desire** to migrate regression, for example, but a slight positive coefficient in the **permanent** migration regression. This could simply have been because older respondents have had more time to migrate—the permanent migration variable tracks *any* previous migration. It remains important, then, to settle upon one of the migration outcomes

(“desire,” “permanent migration”, or “temporary migration”) as most representative of the migration investment problem. We suggest the “**desire**” outcome, since it best represents individuals’ *current* propensities to migrate given their *current* educational achievements. Previous **permanent** migration is a less precise measurement, since we only have data on respondents’ current educational standing (and not from when they had migrated). On top of this, previous **temporary** migration adds an additional caveat, in that temporary labor-related migration skews toward less stable, lower-skill work (since “temporary” indicates short-term work of a few months). Consequently, we argue that temporary migration doesn’t offer the same returns to education that permanent migration does, so we shouldn’t expect education to influence temporary migration in the same way it factors into decisions to permanently migrate.

With this, we prioritize the results from the **desire** and **permanent** migration regressions, and find consistently that higher levels of education indeed make migration more likely, especially if individuals attend college. This is the natural conclusion from understanding migration as an investment problem where individuals with higher education can realize higher returns to migration. Yet these effects are only strong when we consider **desire** to migrate; HS and technical attendance lose statistical significance in regressions on previous **permanent** migration (years of schooling is still significant, though with half the marginal effects as in the **desire** regression). This could be because, as previously explained, we only have data on individuals’ current education (and not from the time of their previous **permanent** migration); in this case, college attendance might be statistically significant only because college *itself* compels permanent migration (to campus). Yet given that all education coefficients (especially on years of schooling) shrink dramatically between the **desire** and **permanent** migration regressions, Mexico could also be a case of individuals wanting to migrate much more than they actually

do—perhaps HS, college, and technical all make migration an interesting idea in one’s mind, but only college attendance is sufficient to actually drive individuals to make permanent migrations.

Non-Education Factors

With the controls, we found some unsurprising patterns in males being much more likely to desire to migrate/have migrated, and married individuals being much less likely to. These follow from Durand and Massey’s work, and general understandings of migration trends worldwide. Age had a -0.35%/yr marginal effect in the **desire** regressions, which makes sense in the investment framework, but had near zero effects in the **temporary** or **permanent** regressions. We didn’t expect age to be significant in the **temporary** regression, since returns to temporary migration are for a fixed period anyways; we strongly believe that in the **permanent** regression, the coefficient on age was drastically affected by the fact that older respondents simply have had more time to migrate. With more time for this study, we would normalize the permanent migration counts (say, dividing by current age minus 16), and would expect to see a similar negative coefficient in the **permanent** regression as in the **desire** regression (and as expected under our investment-returns framework).

Being of indigenous origin was very positively associated with previous temporary migration, likely due to less work being available in more indigenous areas. Yet indigenous origin was very negatively associated with previous permanent migration, which we suggest to be a result of family ties, lower skill/education levels, or discrimination in the labor market (for example, receiving lower wages in Mexico City than a comparable non-indigenous worker).

Biases

For obvious reasons, our constructed measure for years of schooling is biased upwards, since we lack information on whether a respondent’s schooling was ever interrupted (strangely,

MXFLS asks about schooling interruptions in the previous five years from the survey date, but that, of course, only captures the schooling interruptions of younger respondents). Yet this should only have had the effect of attenuating the years of schooling coefficient, meaning that it is likely more significant than what we found.

More broadly, our model is subject to a strong degree of confounding, in that various factors strongly influence both education attainment and propensity to migrate (or desire to). In the U.S., for example, wealthier people both attain more schooling and are more geographically mobile. Yet it remains difficult to control for this, outside of the state fixed effects we had earlier; we could imagine trying to instrument with factors like distance to school (which MXFLS does capture), but that itself is influenced by economic background.

Other Shortcomings

Perhaps most pointedly, in framing migration as an investment problem we've left out the costs of migration. Typically, a distance measure would be used, but given time constraints and the brevity of this work, as well as constraints in what data is captured by MXFLS, even a basic distance cost would be hard to construct, not least because we would also need counterfactuals for those who never migrated or don't have desire to.

We also lack information about many nuances of individuals' education, migration, and other background that could significantly affect how their human capital accumulation relates to their migration prospects.

On the education side, for example, we have no measure about the quality of respondents' education. MXFLS includes some details about educational history, but never goes nearly far enough to illustrate the quality of respondents' education. For example, the survey asks if individuals attended public schools or private schools, but across the heterogeneity of a

nation as large and diverse as Mexico it's impossible to say that one has higher quality. Similarly, the survey asks about classroom floor material (concrete/cement vs. wood vs. soil/sand), but only for schools attended in 2000-2001. With more time, I'd merge other characteristics from respondents' backgrounds—for example, if they lived in rural settings and in what specific parts of Mexico—with external data to better estimate education quality, since “number of years of schooling” only tells us so much.

On the migration side, we've made no use of individuals' origins or the destinations' where they have migrated/wish to (aside from state fixed effects for individuals' current locales). In our migration-investment framework, the baseline wages and returns to education in the origin and destination affect the expected wage gain; we could have obtained these measures either externally or by other regressions on the MXFLS data, but skipped these due to time constraints.

Conclusion

We obtained three migration outcomes and constructed various education measures for around 15,000 individuals from the MXFLS dataset. In general, we found that education achievements (HS, college, and technical attendance, along with years of education) were associated with higher propensities to wish to permanently migrate or to have actually done so. This trend was not clear with an indicator of temporary migration, but we argued that temporary migrations are not representative of the labor/education investment problem that underlies permanent migrations. We analyzed how other demographic factors influence decisions to migrate, or to desire to, and in general found patterns in line with Durand and Massey's Mexican Migration Project (the most significant, of course, being that permanent migration decisions are not out of desperation and instead rational economic decisions).