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Internal migration and the role of the place of origin

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ABSTRACT

This paper investigates empirically the emigration decision of first-time internal migrants in Mexico for the period between 2002 and 2005, and focuses on the role of the characteristics of the place of origin in the decision to emigrate, controlling for initial individual characteristics of internal migrants. We use the rich data provided by the Mexican Family Life Survey and hierarchical modeling techniques. Consistent with previous empirical evidence, we find a pattern of positive selection of emigrants in terms of human capital (measured as level of schooling and with a cognitive abilities test score). We also find that place heterogeneity plays a very important role in migration decisions, explaining between 10 percent and 18 percent of the residual variation in individual migration propensity. We find that social problems in the community are a significant push factor, especially for people with lower levels of human capital. In contrast, availability of public transport discourages emigration, presumably by making commuting less costly. Lack of primary schools and a production structure concentrated on agriculture encourage non-indigenous people to leave their place of origin, while indigenous people are more likely to stay. To the extent that these place characteristics are correlated with lower incomes and standards of living, it suggests that poorer places might become "migration traps" for more vulnerable groups.

JEL Classifications: O15, R23
Keywords: Internal migration; territorial development; Mexico; multilevel models

1. INTRODUCTION

Since the access to the General Agreement on Tariffs and Trade (GATT) in 1986 and the signing of the North American Free Trade Agreement (NAFTA) in 1994, Mexico experienced a radical reshape of its economic geography, driven by large Foreign Direct Investment (FDI) flows towards the North border (Hanson, 1996). Sánchez-Reaza and Rodríguez-Pose (2002) report that, by 1993, the six States at the US border concentrated more than 90 percent of the national employment in *maquiladoras*. This process of market integration had important implications for regional development. This includes a rapid increase of wages in Northern States (Chiquiar, 2008), and a regional reallocation of the labor force, particularly from Southern to Northern states and, more recently, to central and coastal states with a growing tourist sector. Aroca and Maloney (2005) provide empirical evidence of the labor-attraction effect of FDI in recipient Mexican States and conclude that FDI has reduced Mexico's international migration. In the same vein, Chiquiar (2008) report that immigration rates respond to regional wage differentials, and are higher in Northern States.

In a spatial equilibrium world, internal migration should arbitrage away the utility differentials among regions: over time, relative employment and real wage rates should return to their equilibrium levels, while the attributes underlying the utility differentials are capitalized into factor prices (Partridge and Rickman 2003). Internal migration flows are large in Mexico. According to the last Population Census, 17.6 percent of the population (almost twenty million people) were living in 2010 in a different state from where they were born, versus about 12 percent of the population who migrated internationally (UN-DESA and OECD, 2013). However, spatial inequalities in income, human development and growth rates appear to have widened over the last three decades, after a period of regional convergence between 1940 and 1980 (Esquivel, 1999; Esquivel and Messmacher, 2002; Rodríguez-Pose and Gill, 2006; Rodríguez-Oreggia, 2007).[1]

Overall, internal migration in Mexico does not appear to be functioning as a mechanism of ad- justment towards regional convergence in living standards. This may be due to the selectivity of migration processes: if migrants are systematically selected among the younger and better educated, migration tends to improve the stock of human capital of receiving regions, while draining that of sending regions Kanbur et al. (2005). Remittances however might still provide a means for sending regions to improve their living standards. But what if poorer regions are so poor that people cannot migrate out of them? This could be another reason why internal migration is not fostering regional convergence: poorer regions send out fewer emigrants and thus receive fewer remittances. In general, the literature on migration determinants has given more attention to destination characteristics (pull effect) than to the role of origin characteristics. When origin characteristics are considered, they are conceptualized as push factors that encourage emigration. However, local characteristics of the place origin may also represent a constraint to people's ability to move elsewhere, by increasing migration costs.

In this paper we analyze the drivers of internal migration in Mexico for the period between 2002 and 2005. First, we investigate the role of human capital and test the hypothesis of positive selection. Second, we examine whether the characteristics of the place where someone is born affect her decision to emigrate, over and above the role played by individual characteristics; and which place characteristics encourage or constrain emigration. We define migration as the movement of people from one municipality to another, lasting for more than a month, excluding changes of residence within Mexico City or other metropolitan areas. This definition includes temporary, permanent and semi-permanent migration, and excludes commuting and return migration. We restrict the analysis to working-age people who, as of 2002, had never migrated; and compare individuals who continue to stay in their place of birth over the period 2002-05 ("stayers"), with

[1] Rodríguez-Pose and Gill (2006) report a 15 percent divergence in the period 1980-2000.

individuals who migrate for the first time over this period (first-time migrants or FTM). That is, we focus on individuals who had the same migration status at time *t*, but followed different trajectories afterwards, in order to identify which variables account for the decision of one group to move for the first time. The migration decision is analyzed at the level of the individual, as a function of individual, household and community characteristics, all measured in time *t*.

Most studies on the determinants of internal migration in Mexico (for instance, Aguayo-Téllez and Martínez-Navarro (2013)) focus mainly on individual characteristics, especially human capital and access to networks. Aroca and Maloney (2005) find that territorial characteristics at origin do play an important role, but only focus on inter-state migration, and measure local characteristics as an aggregate index and simultaneously with emigration, which could confound the results. We offer an alternative approach by, first, exploiting the very rich data of the Mexican Family Life Survey (MxFLS) and multilevel modeling techniques, which allow accounting simultaneously for the role of individual and place characteristics, and their interaction, in people's migration decision. The MxFLS allows analyzing the role of factors that are typically difficult to capture, especially with the survey data available for Latin America. These include individual cognitive abilities, expectations for the future, local rates of violent crime, and local provision of public goods and amenities. Second, we avoid confounding by measuring origin characteristics before emigration takes place, and not simultaneously, as in Aroca and Maloney (2005). Third, we analyze both inter-state and intra-state migration. Including intra-state migration is important, because it is a fast-growing phenomenon, from 2.3 million people in the 1995-2000 period to 3.1 million in the 2005-2010 period, while inter-state migration has been decreasing over time from 3.6 million people in the 1995-2000 period, to 3.3 million in the 2005-2010 period (Viramontes et al., 2013).

Our results indicate that individual characteristics are a key driver of migration decision, but that the characteristics of the place of origin are also important. Consistent with previous empirical evidence, we find a pattern of positive selection of emigrants in terms of human capital (measured as level of schooling and with a cognitive abilities test score). We also find that place heterogeneity explains between 10 percent and 18 percent of the residual variation in individual migration propensity. Opening up the black box of place heterogeneity, we find that social problems in the community are a significant push factor, especially for people with lower levels of human capital. In contrast, availability of public transport discourages emigration, presumably by making commuting less costly. Lack of primary schools and a production structure concentrated on agriculture encourage non-indigenous people to leave their place of origin, while indigenous people are more likely to stay.

The paper is organized as follows. Section 2 discusses the theoretical framework and Section 3 the empirical strategy. Section 4 presents the data and some descriptive statistics. Section 5 describes the results and Section 6 concludes.

2. MIGRATION DECISION AND THE ROLE OF LOCAL CHARACTERISTICS AT ORIGIN

At the core of migration theories is the view of migration as a human capital investment (Sjaastad, 1962). The migrant's goal is to maximize utility, which comes at least in part from maximizing income. People migrate in response to spatial differences in the returns to labor supply, with the objective of choosing the location that offers the highest net return to human capital. Migration, however, involves up-front costs, which can be monetary and non-monetary (e.g. psychological), followed by an uncertain payoff in the future. Extensions to the basic human capital model of migration include the explicit modelling of local amenities and public goods as components of the utility function and therefore as determinants of the migration decision; and the importance of kinship and migrant networks for reducing migration costs (Bodvarsson et al., 2014). Modern migration theory recognizes that people migrate for a variety of reasons, that motives may differ between temporary and permanent migration, and that spatial inequalities in

quality of life represent the most important predisposing factor for migration, because they lead to the expectation of achieving a higher wellbeing elsewhere (Lucas et al., 1994; Lall et al., 2006; Macours and Vakis, 2010; Alvarez-Cuadrado and Poschke, 2011; Kleemans and Magruder, 2012; Dustmann and Okatenko, 2014).

Borrowing from Dustmann and Okatenko (2014), let variables related to current and potential location be denoted by $k = h$ (home), and $k = d$ (destination). The utility flow u_k of an individual at any point in time depends on her wealth w_k, on the characteristics of the current location, s_k, and on unobserved factors that affect individual utility in either location, e_k:

$$u_k = w_k + s_k + e_k, \quad k \in [h, d] \tag{1}$$

Assuming that the cost of migrating needs to be payed upfront, and that individuals are credit constrained, leads to the budget constraint

$$w_h \geq C(\gamma) \tag{2}$$

Migration costs C depend on the characteristics of the migration process, on the characteristics of both origin and destination places, and on socio-economic characteristics of the individual, all captured by γ. An individual migrates if her expected welfare at destination is larger than at home and if she is able to cover migration costs:

$$\Pr(Migrating) = \Pr\left(u_d > u_h, w_h \geq C(\gamma)\right) \tag{3}$$

This means that migration may be the optimal choice ($u_d > u_h$), yet an individual may not migrate if she doesn't have the resources needed to finance the move. Individuals who do not move ("stayers") are therefore either people who believe their utility is higher at home than elsewhere, or people unable to cover migration costs:

$$\Pr(Migrating) = \Pr\big(u_d \leq u_h, w_h \geq C(\gamma)\big) + \Pr\left(w_h < C(\gamma)\right) \tag{4}$$

The probability of migration increases with wealth for poorer individuals, as is typically found empirically (Hanson et al., 2010). As wealth increases, the relationship between wealth and the probability of migrating will depend on the level of migration costs relative to wealth. Satisfaction with the characteristics of the place of origin, on the other hand, decreases migration propensity.

In this paper, we capture wealth with a wealth index and with a measure of savings. In the vector γ we include human capital and demographic characteristics of the potential migrant, whether she has relatives with prior migration experience, as well as an indicator of whether she has positive or negative expectations for her future. The data do not allow us to capture satisfaction with the characteristics of the place of origin, but we can construct indicators of (a) provision of public services; (b) amenities; (c) social problems; (d) local structure of production. A useful way of analyzing simultaneously the role of individual and place characteristics is to use hierarchical (or multilevel) models, which explicitly recognize that individuals are nested within places and are influenced by the context in which they live. The next section discusses the details of this empirical approach.

3. EMPIRICAL FRAMEWORK

The role of territorial characteristics in migration decisions is investigated empirically using the maximum likelihood estimation of a multilevel logit model, where the hierarchical nature of the data is taken into account and the interaction between the micro-level (individuals) and the macro-level (territorial characteristics) is recognized and explicitly modeled. Multilevel models allow detecting the effects of macro-level characteristics, such as availability of public services, on individual migration decisions, taking into account that the impact of territorial characteristics may vary both across locations and across individuals within the same location. Multilevel models also account for the fact that, in a structure where individuals are nested within communities, individuals within communities are more similar to each other in some respects, than to individuals across communities, because of their shared context and social interactions. When individuals are nested within communities, covariation between higher-level variables and lower-level outcomes cannot be ignored, because it leads to correlated error terms and underestimated standard errors, and increases the probability of concluding that community characteristics are relevant when in fact they are not.

We define migration as the movement of people from one municipality to another, lasting for more than a month. This includes temporary, permanent and semi-permanent migration, and excludes commuting and return migration. Changes of residence within Mexico City or other metropolitan areas is also excluded. The migration decision is analyzed at the level of the individual, as a function of pre-migration individual, household and community characteristics. In order to control for pre-migration characteristics, we focus on first-time migrants (FTM) between the ages of 15 and 65, that is, working-age individuals with no history of migration in 2002 and who have changed municipality by 2005. This includes people who left home at some point between 2002 and 2005 and by 2005 are either back or still away. First-time migrants are compared to working age people who, as of 2005, have never moved ("stayers"). The analysis thus excludes people who have moved at any point before 2002, because information on their pre-migration characteristics is unavailable.

The starting point is a random intercept model of migration propensity. This model tests for the existence of contextual effects, that is, of variation in migration propensity across places, by allowing each community to have a different intercept. Evidence of significant contextual effect may be due to differences in individual characteristics across places, to differences in place characteristics, or to a combination of both. At this stage we are not able to separate between these two sources of contextual effects, but we will be able to do so as the complexity of the model increases. The base random intercept multilevel logit model is:

$$\log\left(\frac{\pi_{ij}}{(1-\pi_{ij})}\right) = \beta_0 + u_{0j} + e_{ij} \qquad (5)$$

where π_{ij} is the probability that an individual i in community j is a first time migrant, β_0 is the overall mean probability of migrating across communities, u_{0j} is the effect of community j on individual migration propensity, and e_{ij} is an individual-level residual. The community effect u_{0j}, or community-level residual, represents the degree of heterogeneity in migration propensities across communities. The individual and community-level residuals are assumed to follow a normal distribution with zero means and variances σ_e^2 and σ_{u0}^2. Both variances are estimated using maximum likelihood (ML) and indicate the degree to which variables at individual and community level contribute to explaining individual variation in migration propensities. The relative weight of community-level variation in explaining migration propensities, that is, the intraclass correlation coefficient, is calculated as

$$\rho = \sigma_{u0}^2/(\sigma_e^2 + \sigma_{u0}^2) \quad (6)$$

Building on the base random intercept multilevel model, the probability that an individual i in community $\boldsymbol{j}$ is a first time migrant is modeled as a function of individual-level characteristics $\boldsymbol{X_{ij}}$ and of community-level characteristics $\boldsymbol{Z}_j$, in a two-level random slope model with contextual effects. This model allows for migration propensity to vary across communities, and for community characteristics to influence the relationship between individual characteristics and migration propensity. That is, each community $\boldsymbol{j}$ is assumed to have a different intercept and slope coefficient:

$$log\frac{\pi_{ij}}{(1-\pi_{ij})} = \beta_{0j} + \beta_{1j}\boldsymbol{X}_{ij} + e_{ij} \quad (7)$$

Place variation in the regression coefficient is modeled as:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}\boldsymbol{Z}_j + \mu_{0j} \quad (8)$$

And

$$\beta_{1j} = \gamma_{10} + \gamma_{11}\boldsymbol{Z}_j + \mu_{1j} \quad (9)$$

Substituting Equations 8 and 9 into Equation 7 and rearranging gives the following two-level random slope model with contextual effects:

$$\log\left(\frac{\pi_{ij}}{(1-\pi_{ij})}\right) = \gamma_{00} + \gamma_{10}\boldsymbol{X}_{ij} + \gamma_{01}\boldsymbol{Z}_j + \gamma_{11}\boldsymbol{X}_{ij}\boldsymbol{Z}_j + \mu_{0j} + \mu_{1j}\boldsymbol{X}_{ij} + e_{ij} \quad (10)$$

The segment $\gamma_{00} + \gamma_{10}\boldsymbol{X}_{ij} + \gamma_{01}\boldsymbol{Z}_j + \gamma_{11}\boldsymbol{X}_{ij}\boldsymbol{Z}_j$ is the fixed part of the model. The segment $\mu_{0j} + \mu_{1j}\boldsymbol{X}_{ij} + e_{ij}$ contains all the error terms and is the stochastic part of the model, with zero means and variances σ_{u0}^2 , σ_{u1}^2 and σ_e^2. Place-level residuals μ_{0j} and μ_{1j} are allowed to covary, and are assumed to have a multivariate normal distribution with an expected value of zero, and to be independent from the residual errors e_{ij}. The term $\boldsymbol{X}_{ij}\boldsymbol{Z}_j$ is included to model the fixed part of the interaction between individual level and community level characteristics.

We measure all individual and community characteristics in 2002, that is, for the case of migrants we are controlling for their pre-migration characteristics. Individual characteristics include wealth, measured with an asset index and with savings; demographic characteristic (age, gender, ethnicity and dependency ratio);

a dummy equal to one if the person has at least one family member with pre-2002 migration experience; and human capital, measured as the number of years of completed schooling, and with her score in a cognitive abilities test (CAS) administered during the survey[2]. Community characteristics include (a) local provision of public goods and services, measured as the number of primary, secondary and higher schools per person and whether public transport is available in the community; (b) amenities: we construct an index using principal component analysis, composed by a set of six dummy variables capturing whether each of the following amenities exists in the community: market infrastructure, museums, library, theatres or cinemas, green areas and sporting facilities; (c) social problems, proxied as the local victimization rate, the number of homicides per 100'000 inhabitants, and prevalence of anti-social behavior; and (d) local production structure, proxied with a dummy equal to one if the only economic sector in the community is agriculture.

4. DATA AND DESCRIPTIVE STATISTICS

4.1 The Data

This paper uses the 2002-2005 panel of the Mexican Family Life Survey (MxFLS). The data is representative at national, rural, urban, and state level and contains information on various dimensions of living standards, including income, consumption, assets, education, health and employment. A community survey is also available for both years, conducted at the level of localities (the administrative level below municipalities). The community survey contains, among others, information on the local availability of public services and amenities (including infrastructure, health and education), production structure and social problems in the community. The migration module is very detailed, and asks, among other things, whether the respondent at the age of twelve was living in her community of birth, and whether she has migrated since. The only publicly available information about destination, however, is whether an individual migrated within the same locality or within the same municipality, and the state of destination. We complement the territorial characteristics available from the community survey with other two sources: World Bank's Small Area Estimates of municipal income, inequality, and food poverty for the year 2000[3]; and INEGI's data on mortality rates in 2002, which we use to compute the number of murders per 100'000 inhabitants per municipality.

The sample used in the empirical analysis includes 7'273 working-age individuals, of which 6'929 are stayers and 344 are first-time migrants, who represent 4.7 percent of the sample. Figure 1 shows the self- reported main reason for migration provided by first-time migrants. More than a third of the respondents report employment as the main reason for migration, followed by reasons related to the life cycle, such as marriage or pregnancy (about 20 percent of first time migrants), and to gaining independence from the family of origin (15 percent). Education and moving closer to family are the next most common reasons for moving. The sample of first-time migrants we are observing, thus, appears to be primarily composed of economic migrants, and of people moving, broadly speaking, for family reasons.

[2] The cognitive abilities test consisted of twelve questions from Raven's Progressive Matrices test (Raven, 2000).

[3] Small Area Estimates (SAE) is a methodology developed by Elbers et al. (2003) to improve the accuracy of survey estimates of municipal poverty by combining survey data with other sources, including population censuses.

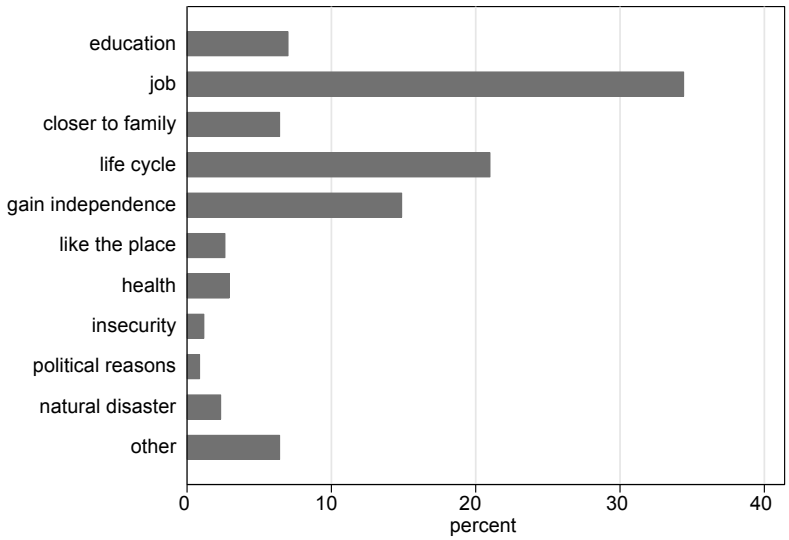

Figure 1: Frequency of self-reported reason for migration, first time migrants. Note: The category "Life cycle" aggregates the following reasons: marriage, pregnancy, death of a spouse, death of other family member, health reasons and health reasons of a family member.

4.2 First-time migrants and stayers: individual and household characteristics

4.2.1 Wealth index

We construct an index of initial (pre-migration) individual wealth using data on assets, since assets can better capture long-term wealth and tend to be less volatile compared to income and consumption (Sahn and Stifel, 2003). The index summarizes information on ownership of consumer durables, housing quality and basic services, captured by, respectively, (a) a set of five dummy variables measuring whether a household member owns a bike, a vehicle, an electronic device, a washing machine or heater, other electrical appliances; (b) a set of four dummy variables equal to one if the house has brick or plastered wall, a sturdy roof (such as corrugated iron, tiles or concrete), a floor made of finished material (such as cement, tile or a laminated material), and if no household member has to sleep in the kitchen; and (c) a set of four dummy variables equal to one if the house has electricity, drinking water inside the dwelling, toilet inside the dwelling, and whether the household uses gas or electricity to cook.

The index is constructed using polychoric principal component analysis (PCA) (Kolenikov and Angeles, 2009)[4]. The proportion of the variance explained by the first component is 0.50. A higher value of the index indicates higher wealth. Table 5 in the Appendix shows the estimated coefficients of the variables composing the wealth index. Figure 2 shows the distribution of the wealth index by migration status, comparing wealth in 2002 between first-time migrants with stayers. A Kolmogorov-Smirnov test indicates that the two groups do not have the same distribution function: except for a small group of very poor

[4] This method assumes that the observed ordinal variables are underlain by latent continuous and normally distributed variables, whose correlation matrix can be decomposed using PCA. The wealth index is the first principal component of these thirteen variables. Polychoric PCA is specifically designed to deal with ordinal and continuous variables.

individuals, first time migrants appear to be better off than stayers.

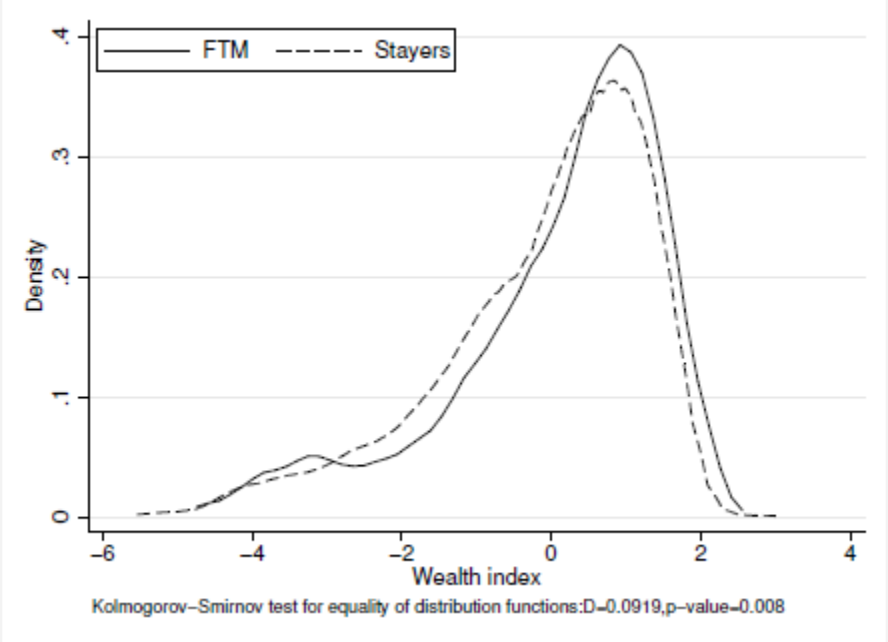

Figure 2: Kernel density distribution of the wealth index by migration status

4.2.2 Other individual characteristics

Table 1 shows descriptive statistics for the other individual characteristics of first-time migrants and stayers. Differences are substantial. First time migrants are on average eight years younger than stayers, belong to households with a lower dependency rate, and are less likely to live in households where other members have had some migration experience before 2002. While there are no significant gender differences between the two groups, first time migrants are significantly less likely to belong to an indigenous group. Consistent with the positive selection hypothesis, migrants appear to be predominantly drawn from the population with quantitatively and qualitatively better human capital: they have on average one more year of schooling, and their cognitive abilities test score is one full point higher than that of stayers. They also have, on average, more positive expectations about the future than stayers. Even though they are younger and have fewer years of experience than stayers, first time migrants are more likely to be in the labor force and to be employed. They are more likely to have recently lost their job or business, but are also more likely to have access to credit and to have savings.

Table 1: Individual characteristics of first-time migrants and stayers

	mean ftm	sd ftm	mean stayers	sd stayers	tstat
Age	25.959	9.822	33.795	13.538	14.146
Female	0.608	0.489	0.590	0.492	-0.650
Ethnic minority	0.119	0.324	0.163	0.369	2.416
Dependency ratio	0.515	0.500	0.614	0.607	3.552
Kin network	0.125	0.331	0.306	0.461	9.656
Years of education	9.050	2.444	8.184	2.506	-6.346
Cognitive abilities test score	7.890	2.891	6.694	2.996	-7.381
In labor force	0.392	0.489	0.336	0.472	-2.094
Employed	0.890	0.314	0.782	0.413	-4.253
Savings	0.235	0.550	0.134	0.463	-3.360
Expectations about the future	0.680	0.467	0.530	0.499	-5.811

4.3 Characteristics of the place of origin

The number of first time emigrants per municipality increases with local income, as Figure 3 shows. Table 2 reports descriptive statistics for the characteristics of the territory of origin of first time migrants and stayers. On average, first time migrants come from wealthier communities that are better endowed in terms of availability of primary schools per person, public transport and amenities, and are less likely to depend only on primary sector activities. They have, however, higher victimization rates, and are more likely to experience anti-social behavior, such as vandalism and similar offences. Moreover, and despite being wealthier on average, they are not significantly less poor or less unequal.

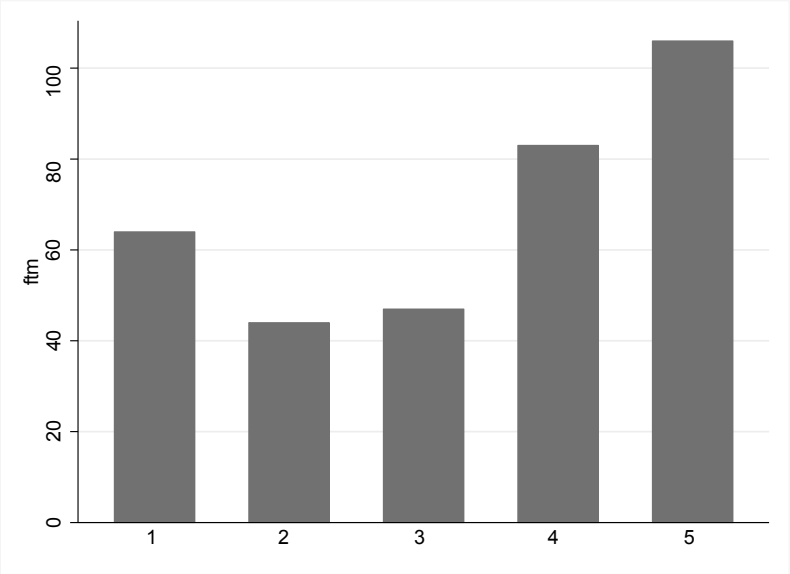

Figure 3: Number of first time migrants by quintiles of municipal income

Table 2: Territorial characteristics of first-time migrants and stayers

	mean ftm	sd ftm	mean stayers	sd stayers	tstat
Estimated income 2000	1460.276	665.624	1351.522	628.856	-2.965
Incidence of food poverty 2000	0.260	0.213	0.269	0.208	0.780
Gini coefficient 2000	0.391	0.049	0.387	0.049	-1.270
Primary schools per person	0.250	0.511	0.127	0.319	-4.244
Higher schools per person	0.029	0.050	0.025	0.060	-1.386
Public transport	0.683	0.466	0.624	0.484	-2.292
Amenities index	0.243	1.136	0.087	1.085	-2.491
Agriculture only	0.230	0.421	0.300	0.458	3.012
Local victimization rate	6.179	5.082	5.551	4.805	-2.242
Homicides per 100'000	8.819	9.736	8.613	8.980	-0.384
Anti-social behavior	0.677	0.468	0.551	0.497	-4.858

5. RESULTS

The data is composed by 7'273 individuals nested within 150 communities. The number of observations per community ranges from 34 to 884, with an average of 154. First time migrants are 4.7 percent of the sample. The first question we address is whether the characteristics of the community of origin

matter for migration decisions, and whether a multilevel model is necessary, by estimating the base multilevel model in Equation 5. A likelihood ratio test comparing this with an intercept-only single-level model provides strong evidence of the existence of community effects on migration propensity and indicates that a multilevel model is to be preferred ($\chi^2 = 61.99$, on 1 d.f.). The constant of the model, β_0, represents the odds of emigrating for the first time from a community with average characteristics, estimated at 4. The odds for individuals living in community j are $\beta_0 + u_{0j}$. The variance of u_{0j} is estimated at 0.60 and variation in migration propensity across communities is wide, ranging from 1 percent to 18 percent. Unobserved community characteristics explain 15 percent of the residual variation in migration propensity, as the intra-class correlation coefficient shows. Figure 4 summarizes the estimated "place effect" on the probability of migrating, averaged by state.

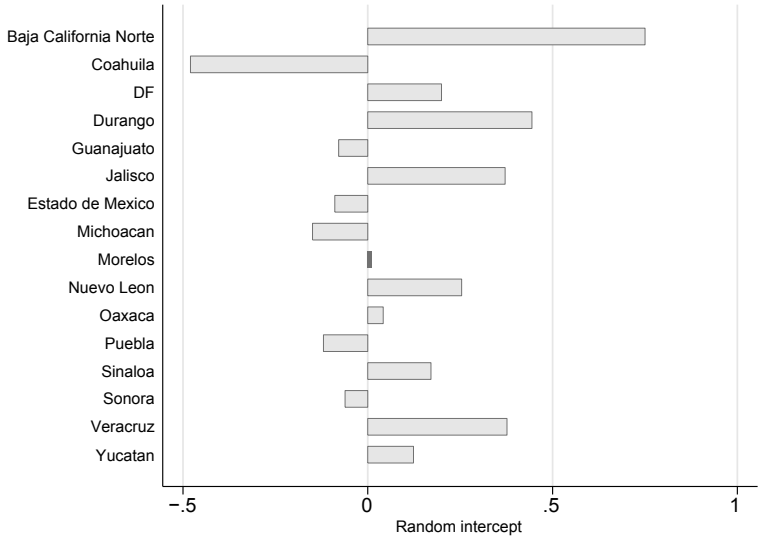

Figure 4: Effect of the territory of origin on the probability of migrating, averaged by state

As a second step, we investigate how individual characteristics relate with migration propensity. Column 1 of Table 3 only considers human capital characteristics and supports the hypothesis of positive selection: a one year increase in education is associated with an 8 percentage points increase in the probability of migrating, and one point increase in the cognitive abilities test score is associated with a 9 percentage points increase. Human capital maintains its importance when controlling for other individual characteristics (Column 5), but the magnitude of the relationship is now smaller. Individual wealth, measured with the assets index, does not appear to have any significant relationship with the probability of emigrating, but having savings significantly increases the probability of emigrating, suggesting the existence of budget constraints and significant migration costs. Consistent with the human capital theory of migration, the probability of moving decreases significantly with age. Probably related to age, the probability of emigrating decreases with the dependency ratio in the household. First time migrants also appear to often be the first migrant in their household: the probability of emigrating is higher when no other household member has prior migration experience. Finally, expecting that one's life will improve in the future is positively and significantly associated with migration propensity. Unobserved community characteristics account for between 14 and 18 percent of the residual variation in migration propensity, as shown by the intra-class correlation coefficient (ICC). Random slope models are also estimated (results available upon request), allowing the role of each individual characteristic in turn to vary across communities. Results suggest that individual characteristics have the same relationship with the

probability of emigrating, regardless of the place of origin of the migrant.

Table 3: Multilevel regression results: individual characteristics

	(1)	(2)	(3)	(4)	(5)
Years of education	0.084***	0.093***	0.093***	0.089***	0.062**
	(0.024)	(0.025)	(0.025)	(0.026)	(0.028)
Cognitive abilities test score	0.088***	0.094***	0.094***	0.095***	0.049**
	(0.022)	(0.023)	(0.023)	(0.023)	(0.024)
Wealth index		-0.076	-0.073	-0.078	-0.074
		(0.056)	(0.068)	(0.058)	(0.062)
Wealth index squared			0.002		
			(0.026)		
Savings				0.581***	0.541***
				(0.154)	(0.156)
Kin network				-1.402***	-1.639***
				(0.178)	(0.182)
Age					-0.053***
					(0.006)
Female					0.194
					(0.125)
Ethnic minority					-0.267
					(0.235)
Dependency ratio					-0.332***
					(0.121)
Expectations about the future					0.376***
					(0.135)
Observations	6634	6559	6559	6503	6503
Between-community variance	0.529	0.543	0.541	0.635	0.703
Log-likelihood	-1259.402	-1244.497	-1244.494	-1194.391	-1135.798
LR test multilevel vs single-level: chi2	46.177	47.332	44.840	56.524	62.646
ICC	0.139	0.142	0.141	0.162	0.176

Exponentiated coefficients; Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

So far, results suggest that place characteristics account for a sizable portion of individual variation in migration propensity, between 14 and 18 percent. But which territorial characteristics are driving this result? Table 4 reports results on the role of community characteristics, controlling for size of the population.

Contextual effects are jointly highly significant ($\chi^2 = 21.19$, on 8 d.f.). Unobserved community characteristics now account for between 11 and 14 percent of the residual variation in migration propensity. Results indicate that anti-social behavior in the community encourages emigration. In contrast, availability of public transport lowers the probability of emigrating, probably by facilitating commuting. Moreover, emigration appears to be lower where the density of primary schools is lower. Other local characteristics do not appear to influence emigration.

Is the contextual effect of community characteristics the same for all people, regardless of their individual characteristics? Two sets of significant differences appear (results for the other tests not shown but available upon request). First, social problems increase migration propensity, but their relevance as a push factor is higher for people with lower levels of human capital, in terms of both fewer years of education and lower cognitive test scores, who thus might be at a relative disadvantage in terms of their ability to settle and prosper in a new location. Second, the role of place characteristics differs between indigenous and non-indigenous people: lack of primary schools and a production structure concentrated on agriculture encourage non-indigenous people to leave their place of origin, while indigenous people are more likely to stay. To the extent that these place characteristics are correlated with lower incomes and standards of living, it suggests that poorer places might become "migration traps" for more vulnerable groups.

Table 4: Multilevel regression results: territorial characteristics

	(1)	(2)	(3)	(4)
Total population 2000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Primary schools per person	0.781***	0.798***	0.778***	0.910***
	(0.268)	(0.298)	(0.301)	(0.312)
Higher schools per person	-3.026	-3.335	-3.476	-3.696
	(2.134)	(2.302)	(2.323)	(2.371)
Public transport	-0.259	-0.531**	-0.495*	-0.451*
	(0.218)	(0.250)	(0.259)	(0.257)
Amenities index	-0.008	0.025	0.033	0.043
	(0.110)	(0.122)	(0.123)	(0.128)
Anti-social behavior?	0.457**	0.437*	0.462**	
	(0.203)	(0.225)	(0.230)	
Homicides per 100'000	-0.012	-0.015	-0.015	
	(0.011)	(0.012)	(0.012)	
Agriculture only	-0.372	-0.357	-0.347	-0.202
	(0.231)	(0.259)	(0.260)	(0.276)
Logarithm of income 2000			-0.134	
			(0.255)	
Social problem index				1.021***
				(0.312)
Social problems*educ				-0.061**
				(0.029)
Social problems*CAS				-0.048*
				(0.025)
Agriculture*ethnic minority				-0.931*
				(0.506)
Observations	6716	5990	5990	5990
Between-community variance	0.422	0.544	0.546	0.622
Log-likelihood	-1219.284	-1021.433	-1021.294	-1016.167
LR test multilevel vs single-level: chi2	32.948	39.428	39.704	46.959
ICC	0.114	0.142	0.142	0.159

Exponentiated coefficients; Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6. CONCLUSIONS AND NEXT STEPS

This paper has investigated the role of individual characteristics and of the characteristics of the place of origin in explaining the emigration decision of first-time internal migrants in Mexico for the period between 2002 and 2005. Consistent with previous empirical evidence, we find a pattern of positive selection of emigrants in terms of human capital, measured both as years of schooling and with a cognitive abilities test. Budget constraints appear to be relevant for the migration decision, as suggested by the significant positive role played by savings. A more optimistic outlook on the future, proxying typically unobserved motivations for migration, is also found to be a strong correlate of migration.

With respect to the characteristics of the place of origin, we find that place heterogeneity plays an important role in migration decisions, explaining between 10 percent and 18 percent of the residual variation in individual migration propensity. Opening up the black box of place heterogeneity, we find that social problems in the community are a significant push factor, especially for people with lower levels of human capital. In contrast, availability of public transport discourages emigration, presumably by making commuting less costly. Lack of primary schools and a production structure concentrated on agriculture encourage non-indigenous people to leave their place of origin, while indigenous people are more likely to stay. To the extent that these place characteristics are correlated with lower incomes and standards of living, it suggests that poorer places might become "migration traps" for more vulnerable groups.

These initial results open up a number of questions that we plan to address in the next steps of this research. First, place characteristics matter, but in some places more than others. For instance, our results show that place characteristics play very different roles in neighbor states with similar agro-ecological and socio-economic characteristics, such as Sinaloa and Sonora, or Coahuila and Durango: in Coahuila and Sonora, place characteristics deter migration, while in Sinaloa and Durango they encourage it. We need to take a closer look at what is driving these results. Second, why some place characteristics affect certain socio-economic groups but not others? And third, we would like to gain a better understanding of the mix of policies, place-based or individual-based, that can be used to improve people's welfare, depending on their migration options.

7. APPENDIX

Table 5: Wealth index: polychoric PCA coefficients

Variable		Coefficient
vehicle	No	-0.154
	Yes	0.278
electronics	No	-0.615
	Yes	0.052
Wash. machine	No	-0.602
	Yes	0.070
appliances	No	-0.578
	Yes	0.085
electricity	No	-0.700
	Yes	0.012
water	Decanter	0.204
	tap inside	-0.136
	tap outside	-0.342
	truck	-0.389
	gathered	-0.507
sanitation	toilet	0.148
	latrine	-0.278
	black hole	-0.435
	no sanitation	-0.610
floor	wood/stone/carpet	0.323
	cement	-0.111
	unfinished material	-0.526
walls	brick/concrete	0.116
	adobe	-0.340
	wood/asbestos	-0.514
	unfinished material	-0.767
roof	beam/concrete/slate	0.134
	asbestos	-0.208
	wood/metal/plastic	-0.315
	unfinished material	-0.527
bedrooms	number	0.198

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