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Pioneers and Followers: Migrant Selectivity and the Development of U.S. Migration Streams in Latin America

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Abstract

We present a method for dividing the historical development of community migration streams into an initial period and a subsequent takeoff stage with the purpose of systemically differentiating pioneer migrants from follower migrants. The analysis is organized around five basic research questions. First, can we empirically identify a juncture in the historical development of community-based migration that marks the transition from an initial stage of low levels of migration and gradual growth into a takeoff stage in which the prevalence of migration grows at a more accelerated rate? Second, does this juncture point exist at roughly similar migration prevalence levels across communities? Third, are first-time migrants in the initial stage (pioneers) different from first-time migrants in the takeoff stage (followers)? Fourth, what is the nature of this migrant selectivity? Finally, does the nature and degree of pioneer selectivity vary across country migration streams?

Keywords

migration; selectivity; cumulative causation; Mexico; Latin America

Introduction

Selectivity has always been a fundamental part of the migration process. Economic migrants are rarely a random cross-section of origin populations, but rather are selected for a number of characteristics that set them apart from their nonmigrant peers. In the case of international migration these individuals tend to be young and single and are often characterized as risk takers. The most selective of all international migrants are those who are first to leave for distant destinations, the so-called pioneer migrants. These migrants do not benefit from the information or support provided by the migrant networks that are so instrumental in helping others travel to a destination, find a place to stay, and get a job. Their willingness to move in the absence of this support is what sets pioneers apart from migrants who follow.

Pioneer migrants play a critical role in the historical development of migration streams. They are the human catalysts for new migrants. The choices they make set in motion processes of cumulative causation and channelization that reverberate across successive generations of follower migrants. Given the fundamental role of the pioneers in setting migration processes into motion, it is surprising that so little attention has been given to identifying them and comparing them to other migrants. The migration literature is full of references to the high selectivity of pioneer migrants, but there are few systematic comparisons of pioneers and followers.

We present here a method for dividing the historical development of community migration streams into an initial period and a subsequent takeoff stage with the purpose of systemically differentiating pioneer from follower migrants. Our analysis is organized around five basic research questions. First, can we empirically identify a juncture point in the historical development of community-based migration that marks the transition from an initial stage of low levels of migration and gradual growth into a takeoff stage in which the prevalence of migration grows at a more accelerated rate? Second, does this juncture point exist at roughly similar migration prevalence levels across communities? Third, are first-time migrants in the initial stage (the pioneers) different from first-time migrants in the takeoff stage (the followers)? Fourth, what is the nature of this migrant selectivity? Finally, does the nature and degree of pioneer selectivity vary across migration streams to the United States from different Latin American countries?

To answer these questions we use retrospective life history data collected in survey questionnaires in thirty-two communities from Mexico, Guatemala, Nicaragua, Costa Rica, and the Dominican Republic (DR). Our analysis makes a methodological contribution to the study of cumulative causation and the development of community-based migration streams, as well as to the study of migrant selectivity. It provides an analytical framework for examining migrant selectivity and cumulative causation in diverse national settings and historical periods.

Cumulative Causation, Selectivity, and Pioneer Migration

The fact that migrants are not a random cross-section of the populations from which they originate is well established in migration studies. Migrants are often found to be young and single, and are described as being ambitious, adventurous, and risk takers (Massey et al. 1987). However, studies of diverse migration streams find considerable variation in the nature and degree of migrant selectivity. An overview of these findings indicates that the level and type of selectivity is related to the characteristics of the places of origin and destination (Hatton and Williamson 2004; Jokisch and Pribilsky 2002; Taylor 1987), the historical relationship between the origin and destination, and the relative age of the migration stream at the time migrant characteristics were measured (Bustamante et al. 1998; Hirabayashi 1993; Jones 1995, 1998).

Migration scholars have introduced the concept of developmental stages of the migration process in part to describe how the characteristics of migrants change over time as migration from a sending area to a destination becomes more common. In general, migration from a place of origin is divided into three periods: first, an initial or pioneer stage, sometimes called the innovator stage; second, a takeoff or early adopter stage; and third, a mature or late adopter stage (Browning and Feindt 1969; Jones 1995, 1998; Petersen 1961; Popkin 1999). Underlying the concept of migration stages are the related processes of innovation and diffusion, and the theories of social networks and cumulative causation (Jones 1995; Lowell 1987; Massey 1999; Stark and Bloom 1985). Together, these processes and theories provide a framework for explaining how migration behavior spreads over time in a community from an individual-level phenomenon to a mass phenomenon. Corresponding to the staged development of migration streams are changes in the level and type of migrant selectivity.

In the initial or pioneer stage, migration is very much an individual-level phenomenon. Migration at this stage is an innovative behavior, with little or no social or institutional supports. Migration between distant locations, and in particular international migration, entails considerable risks in the pioneer stage (Lowell 1987). Pioneer migrants tend to be young and single, and have less restrictive family and financial attachments to their place of

origin (Hirabayashi 1993; Mines and Massey 1985). They have the most to gain from a successful migrant trip and the least to lose from an unsuccessful trip. Although pioneer migrants tend not to own property due to their relative youth, they do tend to come from families with the financial resources to support a trip (Jones 1995, 1998; Massey et al. 1987, 1999). Stark, Taylor, and Yitzhaki (1986) argue that the first households in a community to send a migrant are likely to be from the upper end of the local income distribution, since they are best equipped to take on the risk of a migrant trip.

Although pioneer migrants may be lacking in personal wealth, they are frequently better educated than their nonmigrant peers and have high upward mobility aspirations (Piore 1979). Lowell (1987) found that early emigrants from Norway and Sweden to the United States were positively selected for higher educational achievement. In a very different era and context, Browning and Feindt (1969) found that early cohorts of migrant men in the growing industrial city of Monterrey, Mexico, were better educated than the men who remained behind in their communities of origin.

Pioneer migrants play a fundamental role in initiating migration and setting many of the parameters of subsequent migration streams (Portes and Bach 1995). They are considered by some as trailblazers, clearing the path for subsequent novice migrants (Jokisch and Pribilsky 2002). As innovators they become examples of success for other community members and thereby set in motion the diffusion of new aspirations and behaviors. Yet for migration as an innovative behavior to successfully diffuse throughout the community it requires a structure of social and financial support. Pioneers do not just provide an example of a new behavior; they also facilitate the adoption of this behavior by others. They provide information about wage opportunities to friends and family, connect them with jobs in the destination, and provide them with assistance in getting to a destination and establishing themselves once they get there. Friends and family members who migrate in turn assist others with the migration process. This social dimension of migration is addressed in a large literature on the role of social networks in migration (Massey et al. 1993, Pessar 1999). Social networks that revolve around migration are referred to as migration networks. Migration networks provide a structure of support and mutual assistance for the diffusion of information and resources that makes migration on a large scale possible (Hagan 1998).

The diffusion of migration, facilitated by social networks, leads to the second stage of migration, referred to as the takeoff or early adopter stage. At this stage migration is no longer an individual phenomenon; it has become a social phenomenon. As migration spreads in the community, there is a progressive lowering of the relative costs of migration and a consequent increase in the number of migrants. The net effect of the development of social networks is to alter the selectivity of migration streams as the barriers to migration are progressively lowered (Browning and Feindt 1969; Bustamante et al. 1998, Hirabayashi 1993).

The progressive lowering of the costs of migration and the spread of migration create a situation in which the desire or incentives to migrate become more important as determinants of migration than the anticipated costs or barriers to migration. This situation leads to the third stage in the development of community migration streams: the mature or late adopter stage. At this stage migrants are representative of the local populations from which they are drawn and may even become negatively selected. At the mature stage the prevalence of migration stops growing and eventually declines as everyone in the community with a strong desire to migrate has left.

Innovation and diffusion and migration networks provide explanations for how migration spreads over time in a community, but not why it spreads. The theory of cumulative

causation argues that over time international migration tends to sustain itself in ways that make additional movement progressively more likely (Massey 1990, 1999). At the initial or pioneer stage, migration is highly selective not only because of the high costs of migration, but also because the incentives for migration are more limited to aspirations for economic mobility. The gradual spread of migration creates new incentives for migration so that it becomes a self-perpetuating process. The return flow of migrant earnings alters the relative income distribution in the community of origin, it increases the price of land and residential real estate, it creates new income opportunities locally, and it alters consumption preferences. All of these changes create new demand for income, which in turn spurs on more migration (Piore 1979). The location of family and friends in destination areas creates an incentive for family reunification and provides an additional pull on nonmigrants. According to the theory of cumulative causation, once migration is set in motion an internal dynamic is created that encourages more migration, the incentives for which are increasingly different from the initial starting conditions. The process of cumulative causation leads to a well-structured, staged pattern of migration development. As the number of people in a community who have migration experience grows, the relative costs of migration decline and the proportion of people in a community who know and are related to someone with migration experience increases. The process of network growth and declining migration costs occurs at an accelerating rate until everyone in the community who is likely to migrate has migrated.

The idea that migration levels will grow in a community at an accelerating rate after an initial period of gradual growth, and up to some point of saturation or network maturity, is implicit in the theory of cumulative causation (Massey and Zenteno 1999). The transition from an initial stage of migration to a takeoff stage provides a useful juncture point for distinguishing pioneer migrants from other migrants who follow. Few attempts have been made to model the early growth and takeoff stages of community migration streams and to systematically identify juncture points. In their analysis, Massey, Goldring, and Durand (1994) arbitrarily adopted cut-points of 10, 20, 30, and 40 percent in migration prevalence ratios to define stages in the development of community migration systems. Similarly, Jones (1998) relied on the relative ordering of communities on three dimensions of migration (prevalence, time spent outside of the country, and age of the migration stream) to identify and order communities according to the stage of migration. As Bustamante et al. (1998, 704) point out, the disadvantage of this approach is that it assumes that communities have different migration prevalence levels because they are at different points in the migration process. The method we present does not use the level of migration to differentiate migration stages, but rather uses change in the rate at which the prevalence of migration grows. By focusing on change rather than the level of migration, our method relies directly on the underlying properties of diffusion and cumulative causation to identify distinct migration stages, and improves on earlier approaches both methodologically and substantively.

Data and Methods

We organize our analysis into two parts. First, we fit linear spline regression models to the community-level trends in the prevalence of male U.S. migration. We use these models to locate juncture points in the historical development of migration streams that mark the transition from an initial stage to a takeoff stage. We then use these juncture points to classify male household heads with U.S. migration experience into pioneer and follower migrants. Second, we compare the selectivity of pioneer migrants with that of followers on age, marital status, education, measures of migration resources, and capital assets. We make comparisons of means and proportions within countries for rural and urban communities, and for the total pooled sample.

As a first preliminary step in our analysis we produced graphs of the prevalence of male U.S. migration for all thirty-six communities surveyed by the Latin American Migration Project (LAMP) and for sixty-one Mexican communities surveyed by the Mexican Migration Project (MMP) since 1998. The annual prevalence of male U.S. migration is defined as the proportion of adult men ages 15 and above in a calendar year who had ever been to the United States in that year. It is computed based on the timing of the first U.S. trip for male household heads, the adult sons of household heads, and other male household members who were reported in the household registries of the LAMP and MMP survey questionnaires.

From the resulting ninety-seven communities, we selected communities with migration streams that met two criteria: first, they were initiated in the post-bracero period, defined as having prevalence levels below 0.05 prior to 1965, and second, they had transitioned into the takeoff stage, defined as reaching 0.10 or more after 1965.¹ These restrictions yielded a sample of thirty-two communities from Guatemala, Costa Rica, Nicaragua, the Dominican Republic, and Mexico. Forty-five of the original ninety-seven communities did not meet the first inclusion criterion (post-bracero period migration streams), and twenty communities did not meet the second inclusion criterion (reached a minimum prevalence of 0.10). Figure 1 presents the historical trends in the prevalence of male U.S. migration for the thirty-two communities grouped by country and region. The graphs are left-truncated at prevalence levels below 0.01 and are right-truncated at the time of the survey. For the purposes of comparison, historical trends in the prevalence of female U.S. migration are presented in Appendix A1.

In general, the prevalence levels increase monotonically, with an initial period of flat or slow growth followed by a period of rapid acceleration. In some communities the period of rapid growth is followed by a leveling off. Trends in prevalence levels tend to be similar within country and region and different among countries. These basic patterns are consistent with the emergence of a process of cumulative causation, and they reflect the influence of contextual factors unique to countries and regions on the development of migration streams.

The relatively flat or gently sloping portions of the graphs in Figure 1 correspond to the initial, pioneer stage of U.S. migration, when relatively few men in the communities have traveled to the United States. The duration of this initial stage varies substantially across countries and regions, from a few years to more than ten years. In almost all communities it is followed by an upward swing in the prevalence levels that corresponds to a takeoff stage in U.S. migration. During the takeoff stage the proportion of men with U.S. migration experience increases, although at varying rates across the countries and regions. Male migration increases most rapidly in Quiché, Guatemala; southern Mexico; and several communities in northern and central Mexico.

After a period of accelerated growth, the rate of change in prevalence levels slows, and the curves level off in many communities. This leveling off corresponds to the mature stage in U.S. migration, and it occurs at varying levels. In some communities it occurs when as few as 10 to 15 percent of men have acquired U.S. migration experience, whereas in other communities it occurs when 35 to 45 percent of men have been to the United States. At this stage in the development of community migration streams, virtually every household in the

¹The analysis is limited to migration streams that developed during the post-bracero period to provide a common U.S. historical context. We used the 0.10 migration prevalence threshold as an inclusion criterion because it is widely inclusive of communities in the sample and provides a large enough range of within-community migration prevalence levels to permit the identification of a global inflection point marking the transition from an initial stage to a takeoff stage. In communities with relatively low levels of migration there is the risk that our method of searching for the best-fitting spline regression will identify a local inflection point that marks a minor year-to-year fluctuation in the prevalence of migration rather than a significant longer-term upswing.

community is socially connected to someone who has U.S. migration experience and who can provide assistance in migrating to the United States. The prevalence of male migration stops growing because the opportunity to migrate has reached every socioeconomic segment of the community. The level of migration at the mature stage varies across communities in relation to the income opportunities available locally and the relative costs and benefits of U.S. migration. We expect wealthy communities to reach the mature stage at lower levels of migration than poor communities.

The prevalence of women's migration to the United States in the sampled communities is substantially lower than men's, and women's migration streams tend to start 5 to 10 years after the initiation of men's migration (see Appendix A1). The gap in the prevalence of men's and women's U.S. migration is common throughout Mexico (Cerrutti and Massey 2001) but is greatest in communities of Guatemala and southern Mexico, which tend to be predominantly indigenous in composition and characterized by a patriarchal family-kinship system that confines women's activities to the domestic sphere (Oliveira 1998; Stromquist 1998).

The one important exception to this pattern is the DR, which has a strongly matrifocal system in which females exercise considerable autonomy and generally migrate independently of men (Massey, Fischer, and Capoferro 2006). In three of the four communities sampled in the DR, the historical development of women's U.S. migration parallels men's very closely, and in two communities women's U.S. migration actually takes off before men's.

We fit linear spline regression models to trend curves in the prevalence of male migration for each of the thirty-two communities. The linear spline model uses a series of connected straight lines to describe a nonlinear relationship. The model assumes that a straight line best describes the relationship within discrete intervals, but the slope of the line changes across intervals. The point on the line where there is a change in the slope is called a knot. The trend lines in the prevalence of U.S. migration can be divided into up to three intervals, corresponding to the initial stage of migration, the takeoff stage, and the mature stage. The year that marks the transition from one stage to the next is the location of a knot.

Because our primary focus is on comparing pioneer migrants with follower migrants, we focus our attention on finding the year that best marks the transition from the initial stage to the takeoff stage. For each community we estimated a series of linear spline regression models in which we shifted the location of the takeoff stage knot one year at a time. Our criteria for the best model are having the largest F-statistic as well as a positive and significant ($p > 0.10$) coefficient for the marginal spline.² In communities that had reached the mature stage by the time of the survey, we defined a knot marking the transition from the takeoff stage to the mature stage. Communities were defined as reaching the mature stage if the mean rate of change in the prevalence level was zero or negative in three or more consecutive years at a prevalence level of 0.15 or greater.³ The location of the knot marking the transition to the mature stage was set at the first of these three or more years of nongrowth.

²The linear spline model with coefficients for marginal changes in the slope is specified as follows:

$$\text{prevalence of male migration} = b_0 + b_1 \text{ year} + b_2 \text{ year} + b_3 \text{ year} + u$$

where *year* (calendar year – 1966) ranges from 0 to 41; b_1 is the slope for *year* up to the first knot (initial stage); $b_1 + b_2$ is the slope for *year* between the first and the second knot (takeoff stage); and $b_1 + b_2 + b_3$ is the slope for *year* beyond the second knot (mature stage).

Summary statistics from the best-fitting spline regression models are presented in Appendix A2. Ten of the communities reached the mature stage at prevalence levels ranging from 15 to 45 percent of men with U.S. migration experience. The prevalence level at the first knot, or takeoff point, ranges from a low of around 2 percent to a high of 11 percent of men, with thirteen of the twenty-one takeoff points occurring at prevalence levels below 5 percent. Using our criteria for finding the best-fitting model, we identified a takeoff point in twenty-one of the thirty-two communities. In the eleven communities without a clearly identifiable takeoff point, a spline did not provide a better fit to the data over a single straight line. In several of these communities the slope of the regression line was relatively steep, suggesting a very short initial stage and the rapid spread of migration. The fit of the linear models is exceptionally good in all of the communities, with R^2 ranging from a low of 0.816 to a high of 0.995. The best-fitting models tend to be the models that include a spline for differentiating the initial stage and the takeoff stage. The very high R^2 statistics signal a remarkably high degree of regularity in the development of the male U.S. migration streams in the sampled communities. The factors that distinguish the different historical development trends are the length of the initial stage, the level at which migration takes off in the community, the rate at which it takes off, and the level at which the prevalence of migration stops growing.

Pioneers and Followers

We use the takeoff points in the community migration streams to distinguish pioneer migrants from follower migrants. In ten of the eleven communities that did not have a clearly identifiable takeoff point, we use the within-country mean prevalence level at the identifiable takeoff points to mark the transition from the initial to the takeoff stage. In the single Nicaraguan community that did not have a takeoff point, we use the mean prevalence level at the takeoff point for all twenty-one communities. We restrict our analysis of pioneers and followers to male household heads because data on business and agricultural land ownership was not collected for adult children of household heads who were members of other households.

Table 1 presents the selected characteristics of the thirty-two community samples that we use in the comparison of pioneers and followers. The pooled sample includes retrospective information for 3,562 male household heads. Close to 19 percent of these men had U.S. migration experience, and of those men, roughly one-quarter were pioneer migrants. By definition, pioneer migrants are a very small if not select group of men—fewer than 5 percent of male household heads in the sample. The number of pioneers in each community is too small to provide sufficient statistical power for difference of means and proportions tests. All the community samples in the LAMP and MMP come with sampling weights based on the inverse of the sampling fractions. We adjust the sampling weights to preserve the total number of observations and use the weights in our analysis of the means and proportions. The sampling weights allow us to pool the community samples in order to increase statistical power without giving undue influence to particular community samples. Nevertheless, we provide country means, rural and urban means within countries, and means for all communities pooled to check for consistency in basic relationships across countries and rural-urban places.

³We found that using two consecutive years of zero or negative growth for defining the start of the mature stage was too sensitive to short-term fluctuations in prevalence levels and falsely identified a transition point to the mature stage when in fact migration rebounded and grew in subsequent years. We used a minimum threshold point of 0.15 in the prevalence of male migration as one of the criteria for reaching a mature stage in order to avoid identifying periods of flat growth in migration in the takeoff stage as falsely marking the transition to a mature stage.

Life Cycle Stage and Human Capital

Table 2 presents the mean age at first U.S. trip and the percent of migrants married at the time of first trip for pioneers and followers. Overall, pioneers are significantly younger than followers at the time of their first U.S. trip. On average pioneers made their first U.S. trip when they were in their mid- to late twenties, whereas followers tend to migrate for the first time when they are in their early to mid-thirties. The difference in ages is largest in rural areas, although Guatemala is an exception. Consistent with their earlier age at first migration, pioneer migrants are also more likely than followers to have been single when they made their first trip.

Slightly more than one-half of pioneers were married at the time of their first trip, compared to two-thirds of followers. However, in contrast to age at first trip, the differences in marital status tend to be greatest in urban areas because of the typically later age at marriage in urban compared to rural places. In the Mexican urban communities 42 percent of pioneers were married compared to 69 percent of followers, and in the Nicaraguan urban community 50 percent of pioneers were married compared to 85 percent of followers. The younger age and greater likelihood of being single found among pioneer migrants compared to followers suggests that pioneers are at an earlier stage in the life cycle when they migrate, and therefore have fewer or weaker commitments at home to hold them back or to make an unsuccessful trip too costly to be worth the risk.

Table 2 also presents the mean years of schooling for pioneers and followers vs. nonmigrants. Because the vast majority of men in the sampled communities complete their schooling during childhood or adolescence before migration typically occurs, we can compare pioneers and followers to nonmigrants. Only one of the sixteen difference of means tests comparing pioneers and followers is statistically significant. Rural pioneer migrants in Costa Rica tend to have more years of schooling than rural follower migrants. In all of the other comparisons the differences are statistically insignificant, and with the exception of rural Dominican Republic, comparatively small.

Taylor (1986, 1987) and others (Massey et al. 1987; Massey, Goldring, and Durand 1994) have argued that pioneer migrants are selected from the middle of the income distribution. They have an incentive to migrate and the resources to finance a risky trip, whereas the poor do not have the resources and the wealthy do not have the incentive to migrate. An individual's relative position in the educational distribution tends to be a fairly good proxy of his relative position in the income distribution. Pioneers could be drawn from the center of the educational distribution and followers from the entire distribution, with no difference in their respective means. To check whether pioneers are more concentrated in the center of the distribution we also compared the variances of the distributions of schooling for pioneers and followers. We found no evidence of smaller variances for pioneers compared to followers.

Whereas pioneer migrants do not appear to be selected for higher levels of education compared to follower migrants, migrants in general are selected for higher levels of education than nonmigrants. In the rural Mexico, Guatemala, and Costa Rica samples, and in the urban Mexico, Guatemala, and Nicaragua samples, migrants (pioneers and followers combined) have significantly greater mean years of schooling than nonmigrants. The difference in means ranges from a high of 6 years in Nicaragua to a low of 1.2 years in rural Mexico (migrant means not shown in table). In all sixteen of the possible comparisons between migrants and nonmigrants, the mean years of schooling for migrants are greater than the mean years for nonmigrants. This result is consistent with the findings from other

studies of migrant selectivity from Latin America to the United States (Feliciano 2005; Massey and Sana 2003).

Migration Resources

We examine three measures of migration resources: (1) the number of immediate family members (parents and siblings) of the household head who had made a U.S. trip prior to the household head's first trip, (2) internal migration experience, and (3) access to legal documents on the first U.S. trip. Access to family members with migration experience, prior internal migration experience, and the opportunity to migrate legally to the United States are all known to have a strong influence on the likelihood of initiating a trip to the United States (Fussell 2004; Davis, Stecklov, and Winters 2002; Massey and Espinosa 1997; Reichert and Massey 1979). By definition, pioneers have fewer social ties to experienced migrants than follower migrants do. The results presented in Table 3 confirm this expectation. On average, followers have twice as many family members with U.S. migration experience at the time of first migration than pioneer migrants. Overall, about one-quarter of pioneer migrants had one sibling or parent with prior U.S. migration experience compared to one-half for follower migrants. Having access to a greater number of migrant kin lowers followers' barriers to migration and at the very least is likely to reduce the selectivity of migrants with respect to risk aversion.

A common finding in migration studies is that individuals who migrate in a prior period are more likely to migrate in a subsequent period than individuals with no prior migration experience (Janssen and Zenteno 2005; Massey 1986, 1987; Parrado and Cerrutti 2003; White and Lindstrom 2005). This pattern can be attributed to the selectivity of migrants as well as the importance of experience in influencing subsequent behavior. Migrants are less risk averse than nonmigrants and have greater economic mobility aspirations. Experienced migrants are also better prepared to cope with the uncertainties and disruptiveness of a new trip and therefore are in a better position to undertake migration than nonmigrants. In the case of transnational migration to the United States we might expect prior internal migration experience to be more common among pioneer migrants than follower migrants. This pattern would be consistent with selectivity for a higher tolerance of risk. It also would be consistent with the switch from internal destinations to international destinations that is often observed in rural migrant-sending communities when more remunerative international migration opportunities become available (Davis, Stecklov, and Winters 2002; del Rey 2007; Fussell 2004; Lindstrom and Martínez López 2008; Peña et al. 2000).

Contrary to expectations, pioneers and followers are about equally likely to have had prior internal migration experience at the time of their first trip to the United States. Around one-quarter to one-third of pioneer and follower migrants had internal migration experience prior to making a first U.S. trip. In the within-country comparisons, the differences in proportions are significant only in rural Costa Rica and urban DR. However, the directions of the differences are opposite. Pioneer migrants in rural Costa Rica are more likely than follower migrants to have internal migration experience, whereas in urban DR pioneer migrants are less likely than followers to have internal migration experience prior to first U.S. trip. Rural Dominican Republic is again an exception, but the number of cases is too small in this group to draw any inferences.

The third migration resource we examine is access to legal documents on the first U.S. trip. International migration streams are often initiated through state-sponsored labor recruitment programs that provide pioneer migrants with legal documentation for entry and employment. The Bracero Program that brought 4.6 million temporary workers from Mexico into the United States between 1942 and 1964 is a prime example of a state-sponsored migrant labor

program (Calavita 1992; Massey, Durand, and Malone 2002). All international migration streams are not initiated as temporary-worker programs. Individual-level employment ties established in the origin country with destination-country firms, university training, and marriage are examples of other conditions for migration (Delgado-Wise 2004; Jasso et al. 2000; Oliver 2007). Whether pioneers arrive through a temporary-worker program or through more idiosyncratic conditions, the processes of network formation and cumulative causation open up opportunities for others to migrate with or without legal documents.

Overall, pioneer migrants are significantly more likely to have had legal documents on their first U.S. trip than follower migrants. Forty-two percent of pioneers migrated legally, compared to 34 percent of followers. However, the pattern of differences varies across countries. In the rural and urban Mexican communities pioneers are more likely to have migrated legally than followers, whereas in the rural Guatemalan and Costa Rican communities pioneer migrants are less likely than follower migrants to have had legal documents. In the DR all pioneer and follower migrants had legal documents on their first U.S. trip. These important country differences in the legal status of first U.S. trip reflect the specific geopolitical and historical conditions under which migration to the United States was initiated as well as the relative ease of clandestine entry into the United States.

Capital Assets

We found clear evidence of positive migrant selection with respect to education, which is a good measure of earnings capacity in the home country. Migrants consistently had more average years of schooling than nonmigrants. However, contrary to expectations, we found no evidence to suggest that pioneer migrants were more selective with respect to education than follower migrants. In many developing economies, capital assets in the form of business or agricultural land ownership are an important alternative source of household income to wage employment. Hatton and Williamson (2004) found that early waves of emigrants from Europe to the United States in the first half of the nineteenth century were comparatively well skilled but negatively selected for financial wealth. Table 4 presents the percent of pioneer and follower migrants who owned a business or agricultural land at the time of first U.S. migration. Business ownership includes retail and service activities that entail a fixed location, repair and manufacturing establishments, or a service that entails fixed capital such as trucking or passenger transportation. Street vending, market stalls, and self-employment are not treated as businesses.

In the total pooled sample comparison, pioneer migrants were significantly less likely than follower migrants to own a business at the time of their first U.S. trip. Six percent of pioneers owned a business, compared to 12 percent of followers. The difference is even larger and more significant among migrants from rural communities, where 5 percent of pioneers owned a business, compared to 15 percent of followers. Four of the within-country differences are also significant, and in the same direction: pioneers are less likely to own businesses than followers.

The results for agricultural land ownership are similar to those for business ownership. Overall, pioneers are significantly less likely than followers to own agricultural land at the time of their first U.S. trip. The within-country differences are greatest in Mexico and Guatemala, where followers are two to three times as likely as pioneers to have owned agricultural land. In total, seven of the sixteen difference of proportions tests are significant, with pioneers less likely to own agricultural land than followers at the time of first U.S. trip. The results for capital assets reveal a very clear pattern of lesser asset ownership among pioneer migrants compared to followers. In the cases of both business and agricultural land ownership, pioneers are about half as likely as followers to have either of these assets at the

time of first migration to the United States. Whereas pioneers tend to be younger than followers at the time of first migration, it is unlikely that asset accumulation between the late-twenties and early thirties is large enough to produce the observed difference in asset ownership between pioneers and followers.

Pioneers at an early stage in their lives are clearly at a relative disadvantage compared to follower migrants in terms of income capacity. This disadvantage is not in the area of human capital or earnings capacity, but rather in the ownership of productive sources of capital that are a critical source of income in many households in the study areas. Overall, 25 percent of households in the communities in our analytical sample owned a business, and 22 percent of households owned agricultural land. Migration to the United States thus appears to be a strategy that individuals and households use to accumulate savings for starting up businesses or purchasing farmland (Lindstrom 1996; Massey and Parrado 1998).

The comparative lack of personal wealth among pioneer migrants compared to followers, however, is not inconsistent with the expectation that pioneers come from wealthier households. It is possible that households with more assets or more diverse sources of income are in a better position to absorb the risk of migration by young adult household members during the pioneer phase of migration than poor households are. Data are not available on the assets of the household head's family of origin. However, the seven Guatemalan community surveys from the department of Quiché included inheritance as a means of acquisition of agricultural land and businesses by household heads. If pioneers come from wealthier households we would expect the prevalence of asset inheritance to be higher among pioneers compared to followers. In the Quiché study communities, approximately 22 percent of pioneer migrants acquire agricultural or business assets through inheritance, compared to 29 percent of follower migrants. Again, there is no evidence to suggest that pioneers come from wealthy households.

Conclusions

Prior studies on migrant selectivity have described pioneer migrants as adventurous risk takers with high aspirations for economic mobility. Good measures of these personality traits cannot be obtained from retrospective survey data, thus making it difficult to prove or refute these descriptions. In this article we do not find anything that challenges these characterizations, but we are able to demonstrate that there are features of the socioeconomic position of pioneer migrants that place them in a better position to take on the risks of migration at an early stage than others who migrate at a later stage. Pioneers tend to be slightly younger and are less likely to be married than followers, and they are considerably less likely to have businesses or own agricultural land. Thus, they are in a better position to take a risky trip because they have less to lose from a failed trip. As single young men, their financial commitments at home are less than those of their married peers, and without a business or farmland to hold them back, they are less restrained in the use of their time and labor.

In a sense, pioneers are more likely to be free agents than follower migrants are. The economic consequences of their delayed or even lost income are less severe than is the case with others. They are unlikely to be primary earners in their households or proprietors of a business that requires their daily involvement, or to have primary responsibility for the cultivation of farmland and the care of livestock. On the other hand, pioneers stand to gain more in relative terms than followers from a successful trip. With the savings they acquire from a successful trip, they can establish a business or purchase farmland, and hence improve their position in the local income distribution.

The relatively small number of observations in several of the country clusters prevented us from making systematic cross-country comparisons. Nevertheless, there is a high level of consistency in the direction of selectivity across countries for most of the characteristics we were able to examine, with one exception. Pioneer migrants from Mexico were much more likely to have legal documents at the time of first migration to the United States than follower migrants, whereas in the other countries examined there was either no difference in the percent of legal migrants, or pioneer migrants were less likely to have legal documents. The finding for Mexico reflects the importance of the Bracero Program in initiating U.S. migration in many Mexican communities. The prevalence of legal documentation among migrants at different stages of the development of community migration streams is strongly influenced by period- and country-specific factors not examined in this study that may bear little relation to the diffusion of migration and cumulative causation. For example, all migrants from the DR in the sampled communities entered the United States with legal documents, whereas relatively few follower migrants from rural Mexican and Guatemalan communities entered the United States with legal documents.

The results from the analyses of selectivity and the developmental stages of community migration streams reveal a striking degree of regularity across the diverse Latin American sending countries. Historical trends in the prevalence of male migration to the United States tend to follow an S-shaped pattern in which migration grows slowly until it reaches a critical juncture point, after which the prevalence of migration grows or takes off at an accelerating rate until it reaches a plateau. This S-shaped pattern is implicit in the theories of innovation and diffusion and cumulative causation, although it has not been formally tested using statistical models. The analytical approach we present for modeling historical trends in the prevalence of migration can also be used to test hypotheses regarding the development of international migration streams. For instance, the length of the initial migration stage might be directly related to the incentives to migrate in the origin community. Communities with few local income opportunities and thus strong incentives to migrate might have shorter initial stages than communities with better opportunities. The rate at which migration accelerates in the takeoff stage might be directly related to the size of the origin community. Smaller communities will have denser social networks and hence experience more rapid diffusion of migration than larger communities with more diffuse social networks. The point at which the prevalence of migration levels off might be inversely related to the level of income opportunities in the community of origin. Communities with better income opportunities should reach the mature stage of migration at lower levels of prevalence than poor communities where the incentives to migrate are stronger.

We restricted our analysis to communities that had achieved male migration prevalence levels of 0.15 or higher. A substantial proportion of the communities in the databases did not meet this criterion. In some of the communities migration to the United States was a relatively new phenomenon at the time of the surveys, and therefore sufficient time had not elapsed for migration to enter into the takeoff stage. However, in other communities migration to the United States has been occurring for several decades and does not appear to be taking off. A topic for future research is explaining why U.S. migration takes off in some communities and not in others.

Another area only touched upon in this article and in need of further analysis is the development of female migration streams. Due to space limitations, we presented in Appendix A1 historical trends in the prevalence of women's U.S. migration in the study communities, but we did not model these trends. Unanswered questions include what explains variation in the time lag between the initiation of men's migration streams and women's migration streams? Are the rates of growth in the prevalence of men's and women's migration during the takeoff stage strongly correlated? Why does women's

migration take off in some communities and not in others? We will leave these questions and others identified above for subsequent research.

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Figure 1.

Prevalence of Male U.S. Migration

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Appendix: Figures A1.

Prevalence of Female U.S. Migration

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Table 1

Selected Sample Characteristics, LAMP and MMP (Male Household Heads)

Country (Survey years)	Number of communities	Number of households in sample	Number of pioneers	Number of followers	Number of nonmigrants
Mexico (1998–2007)	14	1,947	67	230	1,364
Rural	7	806	33	143	532
Urban	7	1,141	34	87	832
Guatemala (2000–2004)	10	1,083	45	140	752
Rural	5	219	18	43	143
Urban	5	864	27	97	609
Costa Rica (2000–2002)	3	596	39	81	342
Rural	1	199	20	30	119
Urban	2	397	19	51	223
Nicaragua/Urban (2002)	1	202	4	13	118
Dom. Rep. (2000–2001)	4	560	11	42	314
Rural	1	139	2	13	79
Urban	3	421	9	29	235
Total	32	4,388	166	506	2,890
Rural	14	1,363	73	229	873
Urban	18	3,025	93	277	2,017

Note: Unweighted number of observations.

Life Cycle and Human Capital Resources at Time of First U.S. Trip, Pioneers, Followers, and Nonmigrants, Male Household Heads, LAMP and MMP

Table 2

Country	Mean age at time of first trip		Percent married at time of first trip		Mean years of schooling		
	Pioneers	Followers	Pioneers	Followers	Pioneers	Followers	Non-migrants ^a
Mexico	28.6	30.3	49.1**	71.5	6.9	7.2	6.7
Rural	27.9*	32.0	61.5	74.4	5.6	5.4	4.2**
Urban	28.9	29.0	41.9**	68.8	7.6	8.6	7.6*
Guatemala	29.6	30.7	67.2	76.3	6.6	6.6	5.4**
Rural	31.5	31.0	94.3	83.5	2.2	3.1	1.5**
Urban	29.3	30.7	62.1	75.3	7.4	7.1	5.7**
Costa Rica	26.3**	31.3	57.3	63.6	7.3	7.6	7.1
Rural	27.8*	34.3	70.0	76.7	7.6*	5.9	5.2**
Urban	25.3	30.0	47.8	58.1	7.1	8.3	7.9
Nicaragua/Urban	22.0**	36.8	50.0	84.6	12.0	12.7	6.5**
Dom. Rep.	30.9	30.2	52.5	40.6	9.6	10.3	9.8
Rural	29.0	35.8	50.0	76.9	6.0	7.7	7.0
Urban	31.0	29.1	52.7	33.6	9.9	10.8	10.1
Total	28.5*	30.6	54.5**	67.9	7.3	7.6	7.1**
Rural	28.3**	32.4	66.7	75.4	5.7	5.5	4.4**
Urban	28.7	29.8	49.3*	64.0	8.0	8.7	7.7**

Note: Difference of means (or proportions) significant at

*** $p < 0.01$,

* $p < 0.05$,

† $p < 0.10$.

^a Means for nonmigrants compared to means for migrants (pioneers and followers together).

Table 3
Migration Resources at Time of First U.S. Trip, Pioneers and Followers, Male Household Heads, LAMP and MMP

Country	Mean number of U.S. migration network partners at time of first trip		Percent with internal migration experience at time of first trip		Percent with legal documents at time of first trip	
	Pioneers	Followers	Pioneers	Followers	Pioneers	Followers
Mexico	0.24*	0.49	20.5	26.3	30.6**	11.9
Rural	0.32	0.46	28.9	32.1	16.2*	0.8
Urban	0.20	0.52	16.0	21.4	38.3 [†]	21.1
Guatemala	0.19**	0.59	30.1	31.2	22.3	23.4
Rural	0.28 [†]	0.64	66.8	50.0	0.0 [†]	7.7
Urban	0.17*	0.58	23.2	28.7	26.5	25.5
Costa Rica	0.17*	0.65	35.6	27.1	56.4 [†]	74.3
Rural	0.05*	0.57	40.0 [†]	16.7	25.0**	63.3
Urban	0.27	0.68	32.2	31.4	80.0	78.8
Nicaragua/Urban	0.00*	1.00	25.0	46.2	50.0	84.6
Dom. Rep.	0.62	0.83	22.8	46.5	100.0	100.0
Rural	0.00*	0.62	50.0	7.7	100.0	100.0
Urban	0.67	0.87	20.6 [†]	53.9	100.0	100.0
Total	0.26**	0.58	25.3	30.1	42.2 [†]	33.8
Rural	0.23*	0.50	36.4	30.2	19.5	14.1
Urban	0.27**	0.62	20.8 [†]	30.1	51.4	43.3

Note: Difference of means (or proportions) significant at

** $p < 0.01$,

* $p < 0.05$,

[†] $p < 0.10$.

Table 4

Business and Agricultural Land Ownership at Time of First U.S. Trip, Pioneers and Followers, Male Household Heads, LAMP and MMP

Country	<u>Percent who own a business at time of first trip</u>		<u>Percent who own farmland at time of first trip</u>	
	Pioneers	Followers	Pioneers	Followers
Mexico	7.2	10.2	9.8*	18.9
Rural	6.0*	17.7	19.3	32.2
Urban	7.8	3.9	4.7	7.8
Guatemala	7.2	12.2	6.5**	20.8
Rural	16.3	5.0	22.8*	48.1
Urban	5.5	13.2	3.4**	17.2
Costa Rica	3.2*	13.2	12.9	11.4
Rural	0.0	3.3	30.0	30.0
Urban	5.6	17.3	0.0	3.7
Nicaragua/Urban	25.0	23.1	0.0	7.7
Dom. Rep.	0.0**	17.0	5.0	1.2
Rural	0.0	15.4	0.0	7.7
Urban	0.0*	17.3	5.4	0.0
Total	6.0**	12.0	9.0**	16.0
Rural	5.3**	15.1	21.8 [†]	31.6
Urban	6.1	10.6	3.7 [†]	8.5

Note: Difference of proportions significant at

**
 $p < 0.01$,

*
 $p < 0.05$,

[†]
 $p < 0.10$.

Appendix A1

Male and Female Migration Prevalence Levels and Summary Statistics for Linear Regression Models of Historical Male Migration Prevalence Levels, LAMP and MMP

Country/Community	Prevalence of male U.S. migration (survey year)	Prevalence of female U.S. migration (survey year)	Takeoff point for linear spline	Leveling point for linear spline	Fit of linear regression R ²
Mexico					
61	0.153	0.040	0.021		0.995
82	0.109	0.000			0.816
92	0.206	0.084	0.019		0.978
95	0.139	0.000	0.044		0.963
100	0.275	0.014	0.018		0.964
101	0.297	0.061	0.064		0.980
102	0.171	0.078	0.042		0.982
103	0.313	0.014	0.061		0.978
104	0.129	0.000	0.019		0.955
105	0.251	0.116	0.034		0.986
111	0.434	0.131		0.450	0.975
113	0.094	0.000			0.917
115	0.186	0.040	0.036		0.976
118	0.117	0.000	0.040		0.959
Guatemala					
Quiché					
1	0.164	0.034	0.053	0.173	0.993
2	0.315	0.057	0.096	0.333	0.993
3	0.288	0.036			0.937
4	0.279	0.063	0.029		0.977
5	0.333	0.072		0.371	0.980
6	0.290	0.000	0.113		0.979
7	0.225	0.000			0.884
Quetzal					
1	0.178	0.058			0.932
2	0.194	0.060	0.020	0.196	0.982

Country/Community	Prevalence of male U.S. migration (survey year)	Prevalence of female U.S. migration (survey year)	Takeoff point for linear spline	Leveling point for linear spline	Fit of linear regression R ²
3	0.149	0.000			0.952
Costa Rica					
1	0.262	0.044			0.990
5	0.161	0.061	0.058	0.152	0.992
7	0.209	0.125	0.061	0.213	0.979
Nicaragua					
3	0.115	0.000			0.864
Dominican Republic					
1	0.231	0.236	0.040	0.241	0.989
3	0.115	0.000			0.964
5	0.212	0.144	0.047	0.219	0.992
6	0.138	0.099	0.059	0.150	0.957