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Research Article

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David P. Lindstrom

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The interrelationship between fertility, family maintenance, and Mexico-U.S. migration

David P. Lindstrom[1]

Silvia Giorguli Saucedo[2]

Abstract

This study examines the interrelationship between migration and marital fertility, using a bi-national sample of retrospective life histories collected in Mexican origin communities and U.S. destination areas. We treat couples as the unit of analysis and use discrete-time hazard models to examine: (1) how the timing and parity of births influence the occurrence of migration (to the U.S. or return to Mexico) and the type of migration (solo or couple), and (2) how current migration status and cumulative migration experience influence the likelihood of a birth. Examining the effects of fertility on migration, and the effects of migration on the timing of births, we are able to address how couples integrate migration opportunities and fertility goals into family building strategies in a context where international circular migration is pervasive.

[1] Population Studies and Training Center, Brown University Providence, RI, USA. Tel. 401-863-3765. Fax 401-863-3351. E-mail: David_Lindstrom@brown.edu
[2] Centro de Estudios Demográficos, Urbanos y Ambientales El Colegio de México Mexico City, Mexico

1. Introduction

Mexico-U.S. migration constitutes one of the largest migration systems in the world. In 2004 an estimated 10.6 million Mexican-born persons resided in the United States. The figure represents a 13-fold increase over the number of Mexicans in the United States recorded in the 1970 census (Passel 2005: 37). About 50% of the Mexican-born population residing in the United States does not have legal documentation (Passel 2005: 37). Mexico–U.S. migration is characterized by a significant counter-stream of migrants returning back to Mexico. Up until the mid-1990s, it is estimated that up to 55% of undocumented Mexican men who migrated to the United States returned to Mexico within one year (Reyes 2001: 1192). With the tightening of border controls in the late 1990s and the resulting increase in the costs of being smuggled into the United States, the percentage of annual undocumented Mexican migrants who returned to Mexico within 12 months dropped to around 25% (Massey 2006). Even with the tendency toward longer trips and settled migration, the number of return and circular migrants remains substantial.

The greater incorporation of women into Mexico–U.S. migration streams over the last two decades makes decisions about childbearing and child-rearing closely intertwined with decisions about migration and residential choice. Economic and educational opportunities in the United States, paths to legal residency and citizenship, family size preferences, and differences in the costs of supporting a family in Mexico compared to the United States are factors that couples must weigh in making decisions about which side of the border to locate work and reproduction. This paper focuses on the interrelationship between migration and marital fertility. We first look at how the timing and parity of births influences the occurrence of migration and the type of migration. In particular, we examine how the event of birth and the demands of infant care on a woman's time differentially affect the likelihood of the husband and wife's migration, depending upon whether they are resident in Mexico or in the United States. We then examine how current migration status and cumulative migration experience influence the likelihood of a birth. Examining the effects of fertility on migration and the effects of migration on the timing of births, we are able to address how couples integrate migration opportunities and fertility goals into family building strategies in a context where international circular migration is pervasive. One of the innovations of this paper is that we focus on couples rather than on men or women as the unit of analysis. This analytical approach is consistent with the conceptualization of couples as the locus of migration and fertility decision making, and it allows us to differentiate the underlying determinants of men and women's migration, based on whether migration occurs alone or jointly, and where a husband and wife are located with respect to one another and the border.

2. Migration and fertility

A substantial body of accumulated research based on census and survey data links migration with fertility and family maintenance (Goldstein and Goldstein 1981, Stephen and Bean 1992, Brockerhoff and Yang 1994, White *et al.* 2005). Some studies have considered the impact of migration on fertility (Lee and Pol 1985, Jensen and Ahlburg 2004) and the impact of fertility on migration (White, Moreno, and Guo 1995, Yang 2000), as well as the presence of a non-causal association between the two, rooted in their shared association with other factors that influence both outcomes (Macisco, Weller and Bouvier 1969, Ribe and Schultz 1980, Schultz 1988). Most research that examines the relationship between migration and fertility treats migration as an independent variable and fertility as a dependent variable. In this causal ordering the two most common mechanisms linking migration and fertility are disruption and adaptation.

The disruption hypothesis considers the impact of spousal separation due to the solo migration of the husband or wife on the timing and spacing of births. A number of studies document lower annual probabilities of a birth among couples separated by migration at some point during a year (Chen *et al.* 1974, van de Walle 1975, Massey and Mullan 1984, Lindstrom and Giorguli Saucedo 2002). While spousal separation may in the immediate term delay a birth and disrupt the tempo of childbearing, the impact of separation on completed fertility depends on the expected number of births that would have occurred in the absence of migration, and the duration and frequency of migrant trips. In a sample of Mexican couples in which temporary migration to the United States was widespread, Lindstrom and Giorguli Saucedo (2002) found evidence of lower conception probabilities during years in which husbands departed for the United States, but they found no evidence of long-term separation effects on cumulative fertility. Couples were able to compensate for lost reproductive time by accelerating the timing of births during the years following periods of separation.

The adaptation hypothesis is concerned with the impact of change in residential environments experienced by rural–urban and international migrants on their fertility in the place of destination. Rural–urban and international migration most often involves a move from higher- to lower-fertility areas. The adaptation hypothesis predicts that migrant couples to low-fertility areas adjust their fertility downward after migrating in response to the costs and opportunities they encounter in their new environment, and as a result of the gradual adoption of destination preferences and norms that favor small families (Lee and Farber 1984, Torrealba 1989, Jensen and Ahlburg 2004). In moving to higher income areas, rural and international migrants encounter relative increases in family maintenance costs, increased access to education, a wider array of consumer goods, and more widespread employment opportunities for women. This change in

economic environments reduces for parents the value of high fertility, and increases the real and opportunity costs of each additional child. In addition to the change in economic environments, migrants are also exposed to urban norms and values concerning gender roles, family role relationships, and orientations to child rearing and child investment that provide an ideational basis for low fertility regimes (Lindstrom and Giorguli Saucedo 2002). Studies that examine the adaptation hypothesis typically use duration in the place of destination as a measure of exposure to the destination environment, and predict a negative relationship between fertility and migration experience (Ford 1990, Carter 2000).

Implicit in the adaptation hypothesis is the assumption that migration is long-term. The focus on long-term migration derives in part from the interest in anticipating the contribution of migrant fertility to the growth of destination populations that motivates much of the research on migration and fertility (Goldstein and Goldstein 1981, Stephen and Bean 1992). The focus on long-term migration is also consistent with economic theories that view migration as an investment in human capital and life-time income (Sjaastad 1962, Todaro 1969, Mincer 1978). Fertility adaptation is just one example of a variety of behavioral adaptations that migrants make in response to the opportunities and constraints present in destination environments, and it is part of a multifaceted effort to maximize the long-term returns on migration.

Not all explanations of the relationship between migration and fertility treat migration as the independent variable and fertility as the dependent variable. The selectivity hypothesis views the observed fertility of migrants in destination areas as a function of unobserved characteristics that migrants possess prior to migration rather than an outcome of the migration process. One variant of the selectivity hypothesis, the mobility hypothesis, views both migration and low fertility as behavioral manifestations of a latent desire for upward economic mobility (Macisco, Weller, and Bouvier 1969, Weller and Macisco 1971). Lower fertility and migration are just two of a number of behaviors, including delayed marriage and higher labor-force participation, that women and couples adopt in an effort to achieve socio-economic advancement. Analyses of the impact of migration on fertility typically attempt to control for migrant selectivity by including observed background characteristics that are important determinants of fertility and migration, such as age, education, and marital status (Rundquist and Brown 1989, Singley and Landale 1998). One approach to addressing the potential presence of selectivity along unobserved characteristics is to compare pre-migration fertility to post-migration fertility (Lee and Farber 1984, Lindstrom and Giorguli Saucedo 2002, Lindstrom 2003). If migrants are indeed selected for low fertility, then this behavior should be manifest in the place of origin prior to migration. In a study of rural-urban migrants in Guatemala, Lindstrom (2003) found that women who migrated to urban

areas had lower fertility than their rural counterparts before migration, largely because they were more likely to have delayed marriage.

Another form of selectivity that is linked to migration is high aspirations for children. Couples may search out locations that offer the best educational opportunities for their children, and therefore view migration as an investment in their children's future. In this case, as Jasso (2004) puts it, children are the engines of migration and migrants select themselves into particular migration streams based on pre-existing fertility preferences. Parental desires to invest in the quality rather than the quantity of children can drive migration to low fertility destinations where the educational and future labor-market opportunities for children are considered to be superior to those that are available at home. Rather than migration causing an adjustment in fertility behavior, fertility goals formulated at the outset of union formation drive subsequent migration decisions.

In a study of internal migration in Colombia, Ribe and Schultz (1980) and Schultz (1988) introduced the idea that fertility preferences influence migration choices. Rather than viewing the comparatively lower fertility of migrants (relative to non-migrants in the place of origin) as evidence of adaptation, Ribe and Schultz suggested that migrants selectively chose locations where the amenities and the costs of living were most consistent with their preferences of family size. Couples with preferences for large families chose to remain or move to places where the costs of living were comparatively low, and couples with preferences for fewer children of higher quality chose places that offered greater opportunities to invest in the quality of children. Ribe and Schultz's elaboration of migrant selectivity allows preferences for large families as well as for small families to influence decisions about migration, and it offers an explanation for rural–rural migration in developing countries. Migration driven by family size goals suggests that high fertility or preferences for high fertility will have a negative relationship with couple migration to low-fertility destinations and a positive relationship with residence in rural or semi-urban locations.

The idea that fertility can drive migration is also found in the literature on temporary labor migration and the family life-cycle. Neither is all migration long-term or settled nor is it oriented towards income maximization. A significant body of migration research emphasizes the role of migration as a household strategy to meet current income deficits (Wood 1981, Massey *et al.* 1993, 1994,). From the perspective of household survival, the likelihood that the household head or another member of the household migrates is closely tied to the age and number of dependents in the household. In their study of Mexican migration to the United States in four Mexican communities, Massey *et al.* (1982) described an inverted 'u' shaped relationship between the husband's migration and the family life-cycle. The husband's migration was lowest at the start of marriage and prior to the arrival of children, and then rose as

childbearing and child-rearing occurred and the income needs of the household grew. As children aged and became economically active, a husband's migration to the United States declined. The appeal of temporary migration over long-term settled migration as a way to meet current income needs is enhanced by the superior purchasing power of foreign earnings in low-income countries, the presence of legal barriers to settlement, language and cultural barriers to immigrant incorporation and assimilation, and the tendency of unskilled migrants to work in unstable seasonal jobs in destination labor markets. These factors provide powerful incentives for bi-national strategies of family formation and income generation.

3. Incorporating elements of the life-course perspective

The adaptation and selectivity hypotheses are generally invoked when migration is long-term or settled and couples move together, whereas the disruption and household survival hypotheses are most relevant to temporary migration that involves the repeated separation of couples. Both forms of migration are common in Mexico–U.S. migration streams, as well as different combinations and sequences of the two. Husbands who migrate alone to the United States as target earners may later be joined by their wife and eventually settle in the United States. Couples in the United States may decide to return to Mexico or to resort to a bi-national family maintenance strategy in which the husband works in the United States and the wife returns to Mexico for the purpose of childbearing and child-rearing. The possibility of bi-national household economic and reproductive strategies requires a dynamic modeling approach to migration and a fertility that can track changes in the configuration of husband's and wife's migration status that occur in response to family life-cycle transitions and changes in family size. In this section we bring into our discussion features of the life-course perspective and incorporate parity, the timing of births, and the location and migrant status of the husband and wife.

A life-course perspective offers additional insights into the interrelationship between fertility and migration by drawing attention to the crucial roles of context and timing in demographic processes. Three principles of the life-course perspective identified by Elder *et al.* (2004) that capture the dynamic and contingent nature of migration decision-making across the family life-cycle as it relates to fertility are: the principal of timing, the principal of linked lives, and the principal of time and place.[3] The principal of timing suggests that 'the developmental antecedents and consequences

[3] Elder *et al.* (2004) identify five principals of the life-course perspective, the other two are the principal of life-span development and the principal of agency.

of life transitions, events, and behavioral patterns vary according to their timing in a person's life' (Elder *et al.* 2004: 12). For married couples, the type of migration, whether solo or joint, is closely linked with the stage in the family life-cycle. Joint migration is most likely to occur before the onset of childbearing when the financial and psychic costs of migration are lowest and the time horizon over which the couples can realize the returns on migration is the longest. Once childbearing and child-rearing begin, studies show that the likelihood that a couple migrates declines, whereas the likelihood of men's solo migration increases (Arizpe 1981, Torrealba 1989, Root and De Jong 1991, Tienda and Booth 1991, Cerruti and Massey 2001). An important derivative of the principal of timing is the presence of key turning points in the life-course when decisions are made that have lasting repercussions for subsequent life-course options and trajectories. The birth of a child is an example of key turning points in the life of couples, an event that is likely to have important repercussions on migration decisions.

The principal of linked lives encompasses the idea that 'lives are lived interdependently' (Elder *et al.* 2004: 13). At its most elementary level, the principal of linked lives conveys the importance of viewing married men and women's migration as coordinated and interdependent. This principal is implicit in models of household decision-making that view individual migration behavior as part of a coordinated household strategy to allocate labor resources across different activities and places in order to achieve shared economic goals. The principal of linked lives is often lost in analytical approaches to migration that model men and women's migration as distinct events experienced by independent actors.

The principal of time and place suggests that 'the life-course of individuals is embedded and shaped by the historical times and places they experience over their lifetime' (Elder *et al.* 2004: 12). The community context in Mexico, as in the United States, plays a fundamental role in the formation of family size ideals, in providing opportunities for family maintenance and socio-economic advancement, and in presenting opportunities for solo and family migration to the United States. Studies of fertility identify reproductive norms and practices in communities of origin as playing an important role in early socialization and in the formation of family size goals (Degraff, Bilsborrow and Guilkey 1997, Guilmoto and Rajan 2001, Kirby, Coyle, and Gould 2001). The emphasis on early socialization does not discount the influence of adult experiences, particularly in migrant destinations, on marital fertility, but rather it underscores the cultural clashes that rural–urban and international migrants experience as they circulate between origin and destination environments (Rundquist and Brown 1989).

Migration theories give prominent roles to economic opportunities in the community of origin as a motivation to migrate and as a determinant of the type of

migration, and to community based migration networks, which facilitate migration and channel it to particular destinations (Massey *et al.* 1993, 1994). We expect better economic opportunities at home to discourage out-migration and to encourage return migration from the United States. Consistent with other studies, we expect the prevalence of male and female U.S. migration in the community of origin to exert a strong pull on both men and women, but with the effects of prevalence being strongest for co-gender networks. To control for the importance of historic period, we define our community context variables as time-varying, and we use period controls in our multivariate models.

4. Data and methods

For our analysis, we use retrospective life-history data collected by the Mexican Migration Project in 88 Mexican communities and in selected U.S. destination areas. The communities are drawn from 14 of the 32 Mexican states, and incorporate traditional migrant sending regions as well as relatively new source areas of migration to the United States. The communities were purposively selected to represent a range of sizes, economic bases, and migration levels. They encompass villages and secondary towns, market towns, cities, and metropolitan areas. In most communities, the sample consists of 200 households selected through simple random sampling, although samples tended to be smaller in the less populated places. Sampling frames were constructed by conducting a census of all dwellings in the community or of specific working-class neighborhoods in the case of large urban areas. Interviews in Mexico were typically conducted in December and January, when the return of migrants to Mexico for the Christmas holidays is at a peak. The Mexican samples were supplemented with nonrandom samples of out-migrant households located in the United States. Interviewing in the United States was concentrated in the areas where migrants from each community tended to go, and typically was completed within one month. Snowball sampling methods were used to identify and locate settled migrants. In most cases, the U.S. samples consisted of between 10 and 20 households. Data for the 88 communities and U.S. samples were collected between 1987 and 2002, with three to six communities surveyed in most years (http://mmp.opr.princeton.edu).

The study collected basic demographic and migration data for all household and family members, and life histories for the household head and spouse of the head. We used information on union formation, the timing of all births, the husband's occupational history, and the migration histories of the husband and wife to construct a yearly couple history that begins with the year of union formation and ends with the year of the survey or when the wife reached age 49. To minimize recall error, we limit

our analysis to couples with the wife aged 59 or less at the time of survey. Our analytic sample includes 179,097 couple-years from 10,102 couples. The file includes both formal and consensual unions and is restricted to women and men who were in a union at the time of the survey.[4] Currently divorced or widowed women are excluded from the analysis because the survey did not collect retrospective occupation and migration information on former spouses. The exclusion of currently divorced women from the analysis is unlikely to produce any bias in the analysis. In the 1990 Mexican census, only 4.5% of ever-married women aged 15 to 49 were currently divorced or separated (INEGI 1992) and the crude divorce rate in 1990 was 0.54 divorces per 1000 marriages, which was the 10th lowest rate of 82 countries for which data is available (United Nations 1996).

Table 1 presents selected characteristics of the communities surveyed by the Mexican Migration Project as of the year of the survey. The communities are grouped by the prevalence of U.S. migration and the type of community. The prevalence levels range from high (more than 50% of adult men in the community have some U.S. migration experience) to low (less than 25% of male adults have U.S. migration experience). Even though the prevalence of women's U.S. migration is substantially lower than that of the men, in the high prevalence communities an average of one in four women have been to the United States. To measure fertility, the table presents the mean number of children ever born to women aged 15 to 29 at the municipal-level. The data is taken from the decennial Mexican population censuses of 1950 to 2000. We used linear interpolation to derive estimates of values for intercensal years. Fertility levels also vary across the study sites, but there is no apparent relationship between the mean number of children ever born and the prevalence of migration. As expected, the mean number of children ever born is lower in urban communities than it is in rural communities.

[4] Approximately 4% of the married men in the analysis are in a second or higher union. The survey did not collect union figures for currently married women, thus we do not know how many of the women are in second or higher unions. According to the 1997 Mexican National Survey of Demographic Dynamics, 8% of currently married women aged 15 to 54 were in a second or higher union (INEGI 1997). Because the Mexican Migration Survey did not collect information on the start and end dates of prior unions for the spouse of the household head, our analyses of migrant trips and births are limited to events that occur after the start of the most recent union. Therefore, the women enter the person-year data set starting with the year of their most recent union, and their parity at the outset of that union. We include a control variable for husband's second union in our fertility models.

Table 1: Characteristics of Mexican communities sampled

Type of community	Number of Mexican communities sampled	Number of households sampled		Mean community values: Proportion with U.S. migration experience[a]		Mean community values: Mean CEB aged 15–29[e]
		Mexico	U.S.	Men	Women	
High prevalence of U.S. migration[b]						
Cities	2	356	46	0.546	0.224	2.01
Towns	3	765	62	0.600	0.155	2.58
Villages	9	1107	70	0.633	0.161	2.59
Medium prevalence of U.S. migration[c]						
Metropolitan areas	3	552	47	0.264	0.113	1.98
Cities	16	2752	200	0.362	0.101	2.53
Towns	11	1968	128	0.359	0.071	2.63
Villages	4	400	30	0.387	0.150	2.65
Low prevalence of U.S. migration[d]						
Metropolitan areas	19	3479	102	0.127	0.055	1.97
Cities	5	901	51	0.180	0.062	2.37
Towns	6	767	27	0.155	0.073	2.64
Villages	10	1308	58	0.163	0.028	2.61
Total sample size	88	14,355	821			

Source: Calculations based on COMMUN93, Mexican Migration Project.
[a]–Proportion of men and women aged 15 and above who were current household members at the time of survey and had ever migrated to the U.S.
[b]–More than 50% of adult men from the community have U.S. migration experience.
[c]–25% to 50% of adult men from the community have U.S. migration experience.
[d]–Less than 25% of adult men from the community have U.S. migration experience.
[e]–The mean number of children ever born is measured at the municipal level and is taken from the Mexican censuses.

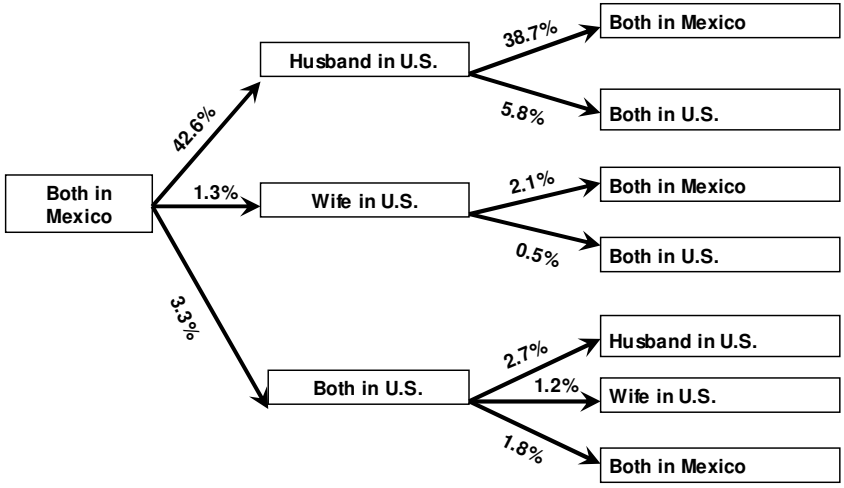
4.1 Dependent variables

To examine the relationship between the timing of births and the timing and type of migration, we define four migration states based on the migration status of the husband and wife: (1) husband and wife together in Mexico, (2) husband in the United States and wife in Mexico, (3) husband in Mexico and wife in the United States, and (4) husband and wife in the United States together. Corresponding to each state is a set of possible transitions into each of the other states, which represent distinct types of migration. For example, in state (1) where the husband and wife are together in Mexico, three types of migration are possible: The husband migrates to the United States alone, the wife migrates to the United States alone, or both migrate together to the United States. Each type of migration represents a transition to one of the other three states. Using the four states and all possible transitions, we can measure the impact of the timing of births and cumulative births on the individual and the joint migration of husbands and wives. We can also identify whether there are key turning points in women's reproductive careers that significantly affect the likelihood of a particular type of migration in subsequent years.

Figure 1 presents the distribution of migration events or transitions between the different couple-states for the 10,102 couples in our analytic sample. A total of 9733 transitions were made by the couples in the sample, which is close to an average of one migration event per couple. The vast majority of migration events correspond to the husband migrating alone to the United States (42.3%) and then returning to Mexico (38.6%). A total of 9% of migration events result in couples being together in the United States either through wives joining their husbands in the United States (5.9%) or couples migrating together to the United States (3.1%). Only 1.3% of transitions involve wives migrating alone from Mexico to the United States, and only 1.1% of transitions involve husbands migrating alone from the United States back to Mexico while their wife remains in the United States.

Our second outcome of interest is the occurrence of a birth in a given year. To examine the impact of migration status and cumulative migration experience on the occurrence of births, we use the same person-year file that we constructed for the analysis of migration events and treat the occurrence of a birth as the event of interest. The analysis of births is based on 41,329 births and 50,530 birth intervals.

Figure 1: Distribution of migration events (transitions) across couple-states in the life histories of married Mexican couples; pooled samples



Source: Calculations based on Mexican Migration Project.
Note: Total number of couples=10,102, total number of migration events (transitions)=9733, percentages sum to 100.0 and are based on the number of all migration events.

4.2 Independent variables

For the analysis of migration, we group our independent variables into fertility measures, husband and wife background characteristics, couple characteristics, and community characteristics. We use a series of dummy variables to define mutually exclusive categories of birth status that capture the parity-specific occurrence of birth and the two years following a birth when the time demands of childcare are the greatest. We also use linear and quadratic terms for parity to allow the underlying risk of migration to respond in a curvilinear fashion to increases in parity. The birth and two-year lagged birth variables allow departures from this underlying parity-specific risk of migration during the years when a birth occurs and when there is an infant in the household.

Husband and wife background variables include education, husband's occupation, dummy variables indicating if the husband or wife had premarital U.S. migration experience, continuous measures of husband and wife's cumulative post-marital U.S. migration experience, and a dummy variable indicating if the husband had legal U.S. documents. The occupation, post-marital migration experience, and U.S. documents variables are time-varying and lagged by one year. Couple characteristics include agricultural land or business ownership (time-varying), an index of the husband's marital power, the period and duration of the migration spell, and the spell duration squared. The husband power index is a composite measure constructed from a factor analysis of the differences in the husband and the wife's age and years of schooling. Men who are older and have a higher education than their wife are assumed to exercise greater influence in couple decisions about fertility and migration (Jejeebhoy 1991, Balk 1997, Hogan, Berhanu and Hailemariam 1999).

Community characteristics include the type of community, the prevalence of male and female U.S. migration, an index of local economic opportunities, and the mean number of children ever born to women aged 15 to 29. All of the community variables are time-varying, with the exception of community type. The index of local economic opportunities is a composite measure constructed from eight municipal-level indicators of economic activity.[5] We use the mean number of children ever born among women aged 15 to 29 in the municipality as a crude proxy measure of fertility preferences. The measures of economic opportunities and fertility at the community level are derived from census data. Communities of origin are one element of the context of early

[5] We started with 11 municipal-level indicators of economic activity and population size gathered from published and electronic sources available for the decennial Mexican population censuses from 1950 to 2000. These indicators are restricted to the economically active population and include the proportion of females aged 15 and above, the proportion of females employed in manufacturing, the proportion of females employed in commerce and services, the proportion of females employed in agriculture, the proportion of males aged 15 and above, the proportion of males employed in manufacturing, the proportion of males employed in commerce and services, the proportion of males employed in agriculture, the proportion of adults aged 15 and above who are owners, the proportion of adults aged 15 and above earning more than twice the minimum wage, and the total municipal population. We then used a factor analysis to identify variables with positive loadings that corresponded to higher levels of economic opportunities. Of the 11 variables, eight had positive factor loadings ranging in value from 0.32 to 0.91 on a single factor that accounted for 68% of the variance in the 11 items. The three variables with negative factor loadings were the proportion of males economically active, the proportion of economically active males employed in agriculture, and the proportion of economically active females employed in agriculture. We then estimated a one-factor model for the remaining eight variables that had positive factor loadings and used the scoring coefficients to construct a single composite index of economic opportunities. The index follows closely indices constructed and used by Lindstrom and Lauster (2001) in a study of migration and economic opportunities in Mexico. We used linear interpolation to derive estimates of the index for intercensal years. For a more extended discussion of the use of census data for measuring economic opportunity in Mexico at the local level, see Lindstrom (1996) and Lindstrom and Lauster (2001).

socialization that has an influence on the formation of family-size preferences. We expect couples in communities with higher fertility to have, on average, preferences for larger families than couples from communities with lower fertility, net of other factors.

For the analysis of births, we use a series of three dummy variables to define the number of months that the couple was separated due to U.S. migration in the prior year. We expect longer periods of separation in the prior year to be negatively associated with the likelihood of a birth in the current year. We use a single dummy variable to indicate if the couple was together in the United States during the prior year, and we include interactions between this variable and parity to determine whether or not the influence on fertility of being in the United States varies by parity. Lindstrom and Giorguli Saucedo (2002) found that the negative effect on fertility of being together in the United States increased with parity in response to the relatively higher costs of having children in the United States compared to Mexico. We also include the log cumulative number of months of U.S. migration experience that men and women have as a measure of exposure to U.S. norms and as an additional test of the adaptation hypothesis.

We include a time-invariant dummy variable to identify women married to temporary or return migrants from the Mexico sample, and a time-invariant dummy variable to identify women from the U.S. sample. Because these variables equal unity even during the years before migration has occurred, they provide a measure of differential fertility that is net of all other factors including U.S. migration experience. Following Lindstrom and Giorguli (2002), we interpret a negative sign as evidence of selection for lower than expected fertility based on all other observed characteristics, and a positive sign as evidence of selection for higher than expected fertility. This approach to controlling for selectivity has its limitations. First, it assumes that the characteristics for which temporary and long-term settled migrants are selected are inherent in individuals early in the lifecourse. Second, it assumes that the selectivity associated with temporary migration and long-term settled migration in the United States is manifest in everyone at the time of the survey. By relying upon household location and migration experience at the time of the survey, this method fails to identify couples who are in Mexico at this time, but who will eventually migrate and settle in the United States. It inappropriately identifies as long-term settled migrants those couples who were resident in the United States at the time of the survey, but who eventually return to Mexico while still in their childbearing years. By the same token, it fails to identify as temporary migrants couples who are in Mexico at the time of survey who have yet to migrate temporarily to the United States but eventually will migrate. The potential net effect of this mismatching in our measure of selectivity is to underestimate the negative impact of long-term migrant selectivity and the positive

impact of temporary migrant selectivity, and to overestimate the negative impact of duration in the United States on fertility.[6]

Finally, we include in the birth model dummy variables indicating if the union is the husband's second union, indicating the wife's birth cohort, the wife's age at the start of the birth interval, and the birth spell duration.

5. Results

5.1 Descriptive statistics

Table 2 presents descriptive statistics for selected socio-economic and demographic background variables. The mean levels of education in the sample are low by U.S. standards but they are close to national averages in Mexico, just over six years for both men and women.[7] Consistent with the relatively low levels of education, close to one-third of the husbands' life-years in the sample were spent working in agriculture, 27% were spent working in unskilled occupations, 30% in skilled occupations, and just 8% in professional occupations. One out of every five husbands first migrated to the United States prior to marriage and on average the husbands had slightly more than one and a half years of post-marital U.S. migration experience. In spite of the relatively widespread nature of U.S. migration in the sampled communities, only one in 20 males had legal U.S. residency or U.S. citizenship. Women's U.S. migration experience is considerably less pervasive than that of the men – only 4% of the women in the sample had pre-marital U.S. migration experience. On average, women had approximately six months of post-marital U.S. migration experience.

[6] See Hoem and Kreyenfeld 2006a, 2006b for a discussion of the pitfalls of using characteristics measured at the time of the survey to model life-course transitions.

[7] In 1990 the mean years of completed education among the adult population in Mexico was 6.6 years (INEGI 2006).

Table 2: Descriptive statistics for selected variables, Mexican married couples; pooled samples

Variable	Mean	Share in %
Husband's and wife's characteristics		
Husband's years of schooling	6.5	
Wife's years of schooling	6.2	
Husband's occupation[a]		
Not working		1.7
Agriculture		32.4
Unskilled		27.4
Skilled		30.1
Professional		8.4
Husband's U.S. migration experience		
Husband premarital U.S. experience		20.4
Husband post-marital months U.S. experience	19.2	
U.S. documents		5.6
Wife's U.S. migration experience		
Wife premarital U.S. experience		4.1
Wife post-marital months U.S. experience	5.9	
Couple characteristics		
Land/business ownership		24.9
Couple-states[a]		
Couple in Mexico		87.9
Husband in U.S.		8.6
Wife in U.S.		0.3
Couple in U.S.		3.2
Period[a]		
1950–1981		41.4
1982–1989		31.1
1990–2002		27.5
Number of couples	10,102	
Number of couple-years	179,097	

Source: Calculations based on LIFEFILE93, SPOUSE93, Mexican Migration Project.
[a]–The percentages are based on couple-years. The percentages and means for all other time-invariant and time-varying variables are measured at the time of survey.

One of the economic factors that keep couples in Mexico and pull them back from the United States is ownership of a business or agricultural land. One-quarter of the couples owned a business or more than 10 hectares of farm land in Mexico. Although U.S. migration is common in the sample, the vast majority (88%) of couple-years in our sample were spent together in Mexico compared to a mere 3% for the United States. Couples were separated by the solo migration of the husband to the United States during almost 9% of couple-years.

The retrospective couple-years cover five decades of Mexico–U.S. migration. Roughly 40% of couple-years occur during the years of high economic growth in Mexico from 1950 to 1981, this compares to 31% during the economic down-turn of the 1980s (1982–1989) and roughly 28% during the most recent decade of economic recovery and moderate economic growth (1990–2002).

5.2 The impact of fertility on migration

To model the impact of birth on migration or to model the transition from one couple state to another, we use multinomial discrete-time hazard regression models. For each of the four states (both in Mexico, husband in U.S., wife in U.S., and both in U.S.), there is a corresponding multinomial regression model. During the years in which couples are in a given state, they are exposed to the risk of solo or joint migration that places them in a different couple state. Because so few wives in the sample migrate from Mexico to the United States while their husband remains alone in Mexico, we do not estimate a model for the couple-state corresponding to the wife being alone in the United States. Couple-years in which the wife is alone in the United States constitute only 0.3% of the couple-years in our sample.

Table 3 presents parameter estimates from the multinomial discrete-time hazard models predicting U.S. migration and return migration from the United States to Mexico. The three models correspond to the three most common couple-states or locations shown in Figure 1; both in Mexico, husband in the United States, and both in the United States. Each of the models estimates the effects of the covariates on the likelihood of transition out of the given state into another state. Although all possible transitions are estimated in the models, we do not present in Table 3 the estimates for wife's solo migration to the United States and husband's solo return to Mexico when both are in the United States. This is because relatively few couples in the sample made these transitions (the results are available from the authors upon request).

Table 3: Parameter estimates from multinomial discrete-time hazard models predicting U.S. migration and return migration from the U.S. to Mexico; pooled samples

Variables	Model 1 Couple in Mexico		Model 2 Husband in U.S. alone		Model 3 Couple in U.S.	
	Husband U.S. migrant	Couple U.S. migrants	Wife joins husband in U.S.	Husband returns to Mexico	Couple returns to Mexico	Wife returns to Mexico
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Fertility						
Birth 1	0.273***	–0.141	0.141	–0.022	0.409	0.035
Birth 2–3	0.359***	–0.287	–0.319	0.303***	0.650*	0.220
Birth 4+	0.418***	–0.583	0.034	0.248***	–0.056	–0.104
$Lag_{1\text{-}2\ years}$(Birth 1)	0.122*	–0.028	–0.320*	0.065	0.253	0.025
$Lag_{1\text{-}2\ years}$(Birth 2–3)	0.108*	–0.510**	–0.543***	0.266***	0.485*	–0.019
$Lag_{1\text{-}2\ years}$(Birth 4+)	0.174***	–0.765**	–0.350*	0.044	–0.157	0.301
Parity	0.069***	–0.260**	–0.160***	0.137***	0.498***	0.206**
$Parity^2$	–0.006***	0.014	0.007	–0.009***	–0.043*	–0.009
Husband's and wife's characteristics						
Husband's years of education[a]	0.033***	0.090***	0.012	–0.026**	–0.047	0.003
Wife's years of education[a]	–0.035***	–0.031	0.055***	0.022	0.033	0.040
Husband's occupation[b]						
Agriculture	0	0	0	0	0	0
Unskilled	0	0	0.690***	0.011	–1.244***	–0.995***
Skilled	–0.147***	–0.029	0.430***	–0.144**	–1.088***	–0.929***
Professional	–0.767***	–0.786***				
Not working	0.269**	0.483	1.334***	0.657***	–0.082	–1.234*
Husband's U.S. migration experience						
Premarital U.S. experience[a]	0.396***	1.034***	0.162	–0.338***	–0.717***	–0.090
Post-marital log months U.S. experience	0.201***	0.176**	–0.394***	–0.275***	–0.864***	0.003
U.S. documents	0.318	1.585***	0.202*	–0.849***	–0.665***	–0.041
Wife's U.S. migration experience						
Premarital U.S. experience[a]	0.025	0.794***	–0.254	–0.278**	–1.019***	–0.571***
Post-marital log months U.S. experience	–0.103***	0.212***	0.166***	–0.176***	0.121	–0.255***
Couple characteristics						
Land/business ownership	–0.374***	–0.034	–0.128	0.145**	0.309	–0.579***
Husband power index[a]	–0.244***	–0.239**	–0.045	0.067*	0.266*	0.118

Table 3: (Continued)

Variables	Model 1		Model 2		Model 3	
	Couple in Mexico		Husband in U.S. alone		Couple in U.S.	
	Husband U.S. migrant	Couple U.S. migrants	Wife joins husband in U.S.	Husband returns to Mexico	Couple returns to Mexico	Wife returns to Mexico
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Period						
1950–1981	0	0	0	0	0	0
1982–1989	0.211***	0.177	–0.410***	–0.015	0.377	0.438**
1990–2002	0.504***	0.187	–0.190	0.203***	0.867***	0.461**
Spell duration	–0.173***	–0.176***	0.059*	–0.413***	–0.169**	–0.267***
Duration^2	0.004***	0.004***	–0.002	0.013***	0.005	0.007***
Community characteristics						
Rural[a]	0	0	0	0	0	0
Town[a]	0.167***	0.158	0.579***	0.226***	–0.052	–0.059
City[a]	0.118**	0.076	0.342*	0.071	0.140	0.233
Metro[a]	–0.197*	0.175	–0.227	–0.268*	–0.886**	1.109**
Prevalence of male U.S. migration	3.255***	0.604	–0.935**	–0.672***	0.665	2.695***
Prevalence of female U.S. migration	–3.376***	6.394***	7.900***	–0.945**	–2.310	–0.294
Economic opportunity index	–0.063	0.029	0.005	0.070	0.560***	–0.198
Community fertility	–0.022	0.237	0.206	–0.215*	0.884**	0.465
$MCEB_{(15–29)}$						
Constant	–4.265***	–6.656***	–3.084***	0.919***	–0.779	–3.170***
Wald Chi-Square		5143***		2529***		681***
Pseudo R^2		0.140		0.200		0.170
Number of couple-years		157,478		15,370		5731

Source: Calculations based on LIFEFILE93, SPOUSE93, Mexican Migration Project.
Significance: '*'=10%; '**'=5%; '***'=1%.
[a]–Time-invariant variables, all other variables are time-varying.
[b]–The reference category for life-years in Mexico is Agriculture/Unskilled. For life-years in the U.S., the reference category is Agriculture; Skilled/Professional is combined into one category.
Not shown in the table are model estimates for the wife being a U.S. migrant (Model 1) and the husband returning to Mexico (Model 3). The results for the two transitions are available from the authors upon request.
Standard errors adjusted for clustering at the community level.

Because couples from the same community are likely to share unmeasured attributes that are also related to migration behavior, the assumption of independence of errors across observations is violated. Failure to adjust for correlated errors can result in underestimates of standard errors for the regression coefficients, making it easier to declare effects significant. The standard errors for the coefficients reported in Table 3 are adjusted for clustering at the community level.

We focus our attention on the couple fertility variables and the community fertility measure. The results for the husband's solo migration to the United States are consistent with the household-survival hypothesis. The likelihood of husbands migrating is greatest in years during which a birth occurs and in the first two years following a birth, and it increases with birth order. The underlying parity-specific risk of migration (as measured by *Parity* and $Parity^2$) also rises, but does so at a decreasing rate.

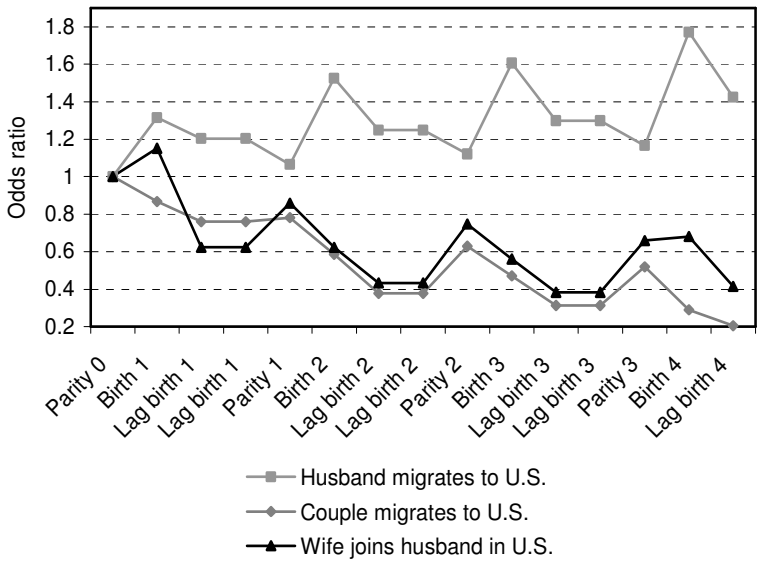
In contrast to the husband's migration, the migration of wives to the United States becomes increasingly less likely as children are born. The turning point for wife's migration appears to be the first birth. The underlying parity-specific risk of migration (*Parity* and $Parity^2$) decreases with each birth, although the actual occurrence of a birth in a given year does not appear to be associated with a significantly lower risk of migration. However, the risk of women's migration does drop significantly in the two years following a birth, and does increasingly so with each additional birth. This basic pattern applies to women migrating alone to join their husband in the United States and to women migrating in the same year with their husband.

Husbands who are alone in the United States are more likely to return to Mexico in a given year if a second- or higher-order birth occurs, or if it is the first or second year after a second or third birth. The parity-specific underlying risk of return (*Parity* and $Parity^2$) also increases with births. This result is contrary to the expectation that a husband's duration in the United States should increase with parity due to the greater income demands that come with more children. The low risk of a husband's return and the high risk that a wife migrates to the United States to join her husband at parity 0 and in the year of a first birth suggest that the first birth is a significant turning point for U.S. migration. If couples are not together in the United States by the time of the first birth, they are very unlikely to be together in the United States thereafter. Husbands who are solo U.S. migrants after the first birth are likely to have entered into a pattern of temporary, repeat migration rather than long-term migration or settlement in the United States. Conceptions that lead to second and third births appear to increase the chances of men's migration, but these same men are also more likely to return rapidly to Mexico in time for or soon after the occurrence of the birth.

Figure 2 presents the graphs of the odds ratios for predicting different combinations of husband's and wife's migration to the United States by parity and the

occurrence and timing of births. The figure simulates a birth history in which the occurrence of births (indicated by birth 1–4) is followed by a two-year period of infancy (indicated by lag birth 1–4), and then another year without a birth (indicated by parity 1–3) before the next birth occurs. The graphs clearly show the divergence in the likelihood of men's and women's migration that occurs after the first birth. It also shows how the risks of men's and women's migration respond differently to the occurrence of a birth and the presence of infants in the household. The migration of the wife is most likely to occur in years during which there are no births or infants in the household, whereas the migration of the husband is most likely to take place during the years in which a birth occurs.

Figure 2: Husband's, wife's, and couple's migration to the U.S., odds ratios for the effects of a birth, lagged birth, and parity



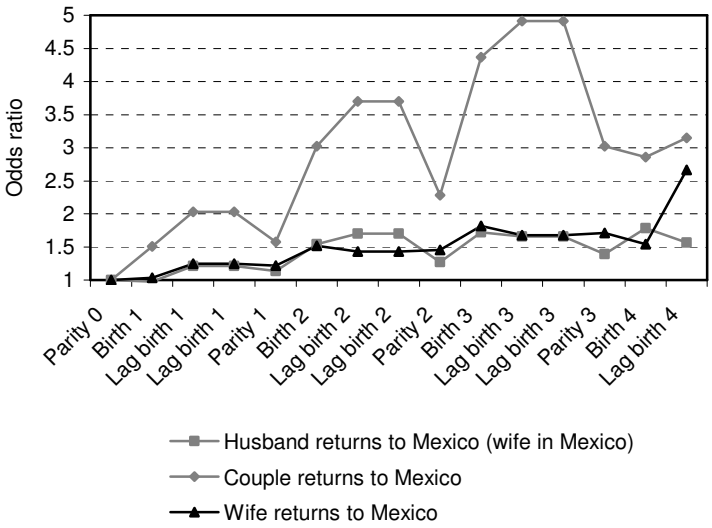
Source: Calculations based on Mexican Migration Project.

The idea that the first birth constitutes a turning point for couple migration is further supported by the results from the model corresponding to the risk of return migration to Mexico for couples in the United States. After the occurrence of a first birth, the odds that a couple returns to Mexico together or that a wife returns alone while her husband remains in the United States increase significantly as indicated by the coefficients for *Parity* and $Parity^2$. The likelihood that a couple returns to Mexico from the United States also increases significantly during the years in which a second or third birth occurs. The progressive rise in the odds of return migration in relationship to the occurrence of an additional birth ends after the third birth. Fourth- and higher-order births in the United States are still associated with a higher risk of return to Mexico compared to first births, but the parity-specific underlying risk of return rises at a substantially diminished rate (*Parity* and $Parity^2$).

Figure 3 presents the graphs of the odds ratios for predicting husband's and wife's return migration from Mexico to the United States. The figure shows that the likelihood of a couple returning to Mexico rises significantly with the occurrence of a birth and in the two years immediately following a birth. In contrast, the likelihood of the return of the husband to Mexico from a solo trip to the United States and the likelihood of the wife's solo return to Mexico when the couple are together in the United States show only moderate changes. In the case of a wife's solo return to Mexico, only the linear parity term (*Parity*) was significant in Table 3. The decision to return to Mexico tends to be made early in the process of family building. If a couple has not returned to Mexico soon after a third child is born, the chance that they will return, at least in the near term, drops substantially.

One of the factors that draw couples back to Mexico, and especially couples with a preference for large families, is the relatively lower cost of family maintenance in Mexico compared to the United States and the relatively higher purchasing power of U.S. dollars in Mexico. We predict that the attractiveness of return to Mexico is larger for couples with higher fertility preferences. Our proxy measure of fertility preferences, the mean number of children ever born in the municipality of origin, is positive and a significant predicator of return to Mexico. The positive effect of mean fertility in the place of origin is net of the type of community (rural, town, city, metro), the level of economic development, and the prevalence of U.S. migration. A 0.5 increase in the mean number of children ever born to women aged 15 to 29 increases the likelihood that a couple in the United States will return to Mexico by 60% ($1.6=e^{0.5\times0.884}$).

Figure 3: Husband's, wife's, and couple's return migration to Mexico: odds ratios for the effects of a birth, lagged birth, and parity



Source: Calculations based on Mexican Migration Project.

Net of other factors, couples who are from communities with above average fertility are more likely themselves to possess higher than average family-size preferences. Preferences for larger families are more easily realized in Mexico than in the United States, although a large family may entail a split household structure in which the husband migrates to the United States in order to meet household-income needs. Consistent with this observation, high fertility in the community of origin is marginally related to a lower risk of return to Mexico, and thus to longer trips among men who are in the United States alone.

5.3 Migration and the timing of birth

We now turn to the influence of migration on the timing of birth. In the prior analysis, we identified the first birth as a turning point in couple migration histories. In the analysis that follows, we examine whether or not a first birth in the United States represents a distinct fertility event from first births in Mexico and from subsequent births in the United States and Mexico. We also further explore the question of whether return migrants to Mexico are selected for higher than expected fertility, and long-term or settled migrants in the United States for lower than expected fertility. Our analysis updates work by Lindstrom and Giorguli (2002) on the impact of migration on fertility that used an earlier sample of 43 communities from the Mexican Migration Project. In their analysis, Lindstrom and Giorguli found that long-term and settled migration in the United States was associated with significantly lower fertility. They also found that a husband's solo migration to the United States temporarily depressed fertility but that it had no long-term impact on completed fertility.

Table 4 presents the results of the logistic discrete-time hazard regression model predicting a birth. U.S. migration experience, whether it be in the form of a husband's solo migration (the lag separation variables), a wife's cumulative experience, or couples being together in the United States is associated with a lower annual risk of a birth. The one exception to this pattern is when couples were at parity 0 and in the United States. The risk of a first birth is 1.4 ($e^{0.370}$) times greater when couples were in the United States in a prior year than when couples were in Mexico. After the first birth, the annual risk of a second- or higher-order birth to couples who were in the United States declines dramatically. Overall, the results for the separation variables, residence in the United States, and the wife's cumulative migration experience are consistent with the predictions of the disruption and adaptation hypotheses.

The selectivity variable, *Settled migrant*, is also consistent with the hypothesis that long-term or settled migration in the United States is selective of preferences for smaller families. Net of other factors, couples from the U.S. sample have an 8% ($1–e^{-0.087}$) lower risk of birth in a given year than non-migrant couples who remain in Mexico. This result holds for any year of a couple's reproductive years, including the years before the couple migrated to the United States.

Table 4: Parameter estimates from logistic discrete-time hazard model predicting birth in a given year; pooled samples

Variables	Outcome: Birth	
	Estimate	
U.S. migration experience		
Lag_1 (separated 1–3 mos.)	–0.102	*
Lag_1 (separated 4–7 mos.)	–0.108	**
Lag_1 (separated 81–2 mos.)	–0.260	***
Lag_1 (together in U.S.)	0.370	***
Lag_1 (together in U.S.) × parity 1–2	–0.397	***
Lag_1 (together in U.S.) × parity 3+	–0.820	***
Lag_2 (husband's log cumulative months U.S. exp)	0.002	
Lag_2 (wife's log cumulative months U.S. exp)	–0.044	***
Selectivity		
Non-migrant	0	
Temporary/return migrant	0.030	
Settled migrant (U.S. sample)	–0.087	**
Husband's and wife's characteristics		
Husband's years of education[a]	–0.014	***
Wife's years of education[a]	–0.024	***
Husband's occupation		
Agriculture	0	
Unskilled	–0.057	***
Skilled	–0.082	***
Professional	–0.015	
Husband's second union	–0.173	***
Wife's cohort		
Before 1940	0	
1940–1949	0.148	***
1950–1959	–0.226	***
1960–1986	–0.426	***
Wife's age (start of birth interval)[a]		
15–19	0	
20–24	0.034	*
25–29	–0.227	***
30–34	–0.611	***
35–39	–1.132	***
40–44	–2.043	***
45–49	–3.240	***

Table 4: (Continued)

Variables	Outcome: Birth	
	Estimate	
Couple characteristics		
Land/business ownership	–0.081	***
Parity		
0	0	
1–2	–0.115	***
3+	–0.325	***
Spell duration (year)		
1	0	
2	1.201	***
3–5	0.594	***
6+	–0.311	***
Community characteristics		
Rural[a]	0	
Town[a]	0.131	***
City[a]	0.077	***
Metro[a]	0.140	***
Prevalence of male U.S. migration	0.370	***
Prevalence of female U.S. migration	–0.639	***
Economic opportunity index	–0.116	***
Community fertility $MCEB_{(15–29)}$	0.132	***
Constant	–0.815	***
Wald Chi-Square	16,570	***
Pseudo R^2	0.150	
Number of couple-years	179,097	

Source: Calculations based on LIFEFILE93, SPOUSE93, Mexican Migration Project.
Significance: '*'=10%; '**'=5%; '***'=1%.
[a]–Time-invariant variables, all other variables are time-varying.
Standard errors adjusted for clustering at the community level.

At the community level, a high prevalence of male migration to the United States and a high mean number of births to women aged 15 to 29 are both associated with a higher risk of a birth in a given year. Both of these results are consistent with the conclusion drawn from the fertility and migration analysis that high fertility may be driving some of the men's migration from Mexico to the United States. On the other hand, better economic opportunities at the local level in Mexico and a higher prevalence of female migration to the United States are associated with significantly lower risks of

a birth. The negative association between economic opportunities and fertility is consistent with the conventional relationship between economic development and low fertility found in so many other contexts. Lindstrom and Giorguli (2002) found the same negative relationship between fertility and the prevalence of female migration in their earlier analysis. They attribute the relationship to the diffusion of low-fertility norms and behaviors back to the communities of origin by return and visiting migrant women. It should be emphasized again that for U.S. migrants the community-level variables refer to the community of origin in Mexico and not to the U.S. destination.

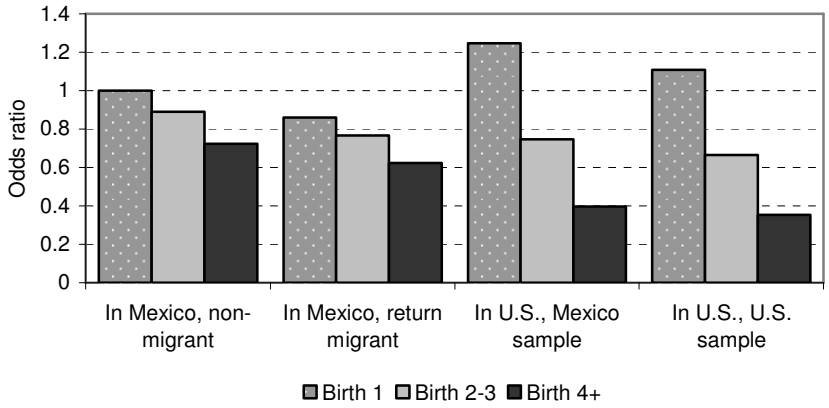
Figure 4 presents simulations of the odds ratios for predicting parity-specific births for four different migration status groups. The first two groups of bars in the figure correspond to the risk of birth for non-migrant couples in Mexico and for couple-years spent in Mexico by return migrant couples, respectively. Return migrants are couples who were interviewed in Mexico and for whom both the husband and wife have six years of cumulative U.S. migration experience. Six years corresponds closely to the mean duration of migration experience for men and women in the sample who have ever been to the United States (70 months for men and 73 months for women). The last two groups of bars in the figure correspond to couple-years spent in the United States by couples who eventually return to Mexico, and couple-years spent in the United States by couples who were interviewed in the United States as settled migrants. Men and women in these two groups also have six years of cumulative U.S. migration experience. The simulated odds ratios illustrate parity-specific differences in the likelihood of a birth by place and prior U.S. migration experience. The reference group for all of the odds ratios is birth 1 among non-migrant couples in Mexico.

The basic tempo of childbearing in Mexico among couples with some U.S. migration experience is slightly slower than that of non-migrant couples in Mexico, although this is not to say that return-migrant couples will not eventually go on to have the same number of children as non-migrant couples. In contrast, the risk of a first birth during years in which couples are in the United States is significantly higher than the risk of a first birth in Mexico and it is higher than the risk of higher-order births in the United States. Figure 4 also clearly shows the substantial decline in the likelihood of an additional birth in the United States that occurs at each parity after the first birth. Fourth- and higher-order births are particularly less likely to occur among couples in the United States compared to couples in Mexico.

We suspect that the higher relative risk of a first birth in the United States is related to the higher risk of a wife's U.S. migration before or in the year of a first birth. Among married women who migrate to the United States after marriage, but before the first birth, the first birth interval (i.e., the interval between marriage and the first birth) is split between Mexico and the United States. If the first birth interval among these same women is not substantially longer than that of non-migrant women in Mexico,

than the estimated risk of a first birth in the United States will be higher because the portion of the interval that ends in a birth occurs in the United States. To explore this possible explanation further, we compared the mean age at marriage and the mean length of the first birth interval for non-migrant and migrant women. U.S. migrant women in the sample tend to marry on average 1.5 years later than do non-migrant women in Mexico (21.5 compared to 20.0 years); however, they tend to have a first birth at roughly the same time after marrying as non-migrant women. The mean length of the first birth interval for migrant women is 1.8 years compared to 1.5 years for non-migrant women. This result suggests that U.S. migration at the outset of marriage does not disrupt the timing of the first birth. Put another way, U.S. migrant couples do not appear to delay or postpone first birth. However, after the first birth, the tempo of childbearing among women in the United States increasingly diverges from the tempo of childbearing among women in Mexico.

Figure 4: Odds ratios of a birth in a given year by parity and current migration status, life-time migration status, and sample location



Source: Calculations based on Mexican Migration Project.

6. Discussion

The interrelationship between migration and fertility is complex and multifaceted. Births are not only delayed or averted as a consequence of migration, but migration as well is initiated, postponed, or deterred as a consequence of births. The complexity of the interrelationship between migration and fertility stems from the fact that migration is used as a strategy for long-term economic mobility and as a way to satisfy current income needs.

We examined several different mechanisms by which fertility can influence migration. Prior studies have shown a strong relationship between stages in the family life-cycle and men's and women's migration from Mexico to the United States. We expand on this earlier work by looking more closely at the impact of the timing of parity-specific births and the presence of infants in the household on the risks of husband's and wife's migration. We find that births constitute an important catalyst for men's migration and are turning points for women's migration. Married women are most likely to migrate to the United States before or in the same year as the first birth. Once the first birth occurs, however, the likelihood of migration decreases progressively with each additional birth. In addition, at any given parity after the first birth, the wife's migration is least likely to occur during the two years immediately following a birth.

With each additional birth, the childcare demands on women's time increase as do the income demands on men's time. Highly gendered family-role specialization in Mexico pulls young mothers into the home for childcare and pushes men into U.S. labor markets where the economic returns on men's labor are greatest. This role specialization generates a divergence in the likelihood of men's and women's migration during the childbearing and early child-rearing years of the family life-cycle. Once a couple begins childbearing in Mexico, the options for U.S. migration narrow considerably.

Among couples who migrate to the United States or who are reunited in the United States, the likelihood of return migration to Mexico also responds in a very marked way to the occurrence and timing of births. As was the case in Mexico, the initiation of childbearing in the United States marks a turning point for couples. With the occurrence of the first birth the risk of return migration to Mexico rises. The decision about return migration, however, is mainly a decision about whether to stay together in the United States or to return together as a family to Mexico. The wife's solo return migration to Mexico rises only moderately with parity and is not sensitive to the timing of births. However, the risk that a couple returns together to Mexico increases sharply with the first three births and it is especially high during the years in which a birth occurs and the two years immediately following a birth. However, after the third birth, the risk of

return drops considerably and changes little with each additional birth. We suspect that schooling may be one of the reasons why the third birth constitutes a turning point for return migration. By the third birth, the first child is at or near school age. The entry of children into school marks a new phase of child-rearing and family settlement. The decision to begin educating children in the United States represents a higher level of integration with the host society than having a birth. Once children enter school in the United States, return migration to Mexico becomes increasingly less likely.

In this study we also examined how migration can influence fertility. Much of the literature on migration and fertility focuses on the disruptive and transformative influences of migration on fertility, and views migration as triggering adaptive responses that may not be entirely anticipated by the migrants themselves. The experience of moving from high- to low-fertility environments not only impacts fertility behavior in the immediate term through the costs and constraints of urban living, but also in the longer term as couples are challenged to consider their family-size goals and how they think about the financial and time demands of children. We found evidence of both short-term disruption effects and longer-term adaptation. Women are less likely to experience birth in a given year when their husband was away in the United States for more than three months during the prior year. This result is not surprising and is consistent with earlier findings by Massey and Mullan (1984) and Lindstrom and Giorguli (2002).

However, contrary to predictions of the disruption hypothesis, we find that women's migration to the United States before the first birth does not appear to disrupt the timing of the first birth. In part, this finding is the result of splitting the first-birth interval across national borders, with the second part of the interval occurring in the United States. Another possible explanation for this result is that couples are anxious to have a birth in the United States with the expectation that the child's right to U.S. citizenship will open a future route to legal immigration status for the parents. In addition, migrant women may decide not to postpone a first birth in order to finish childbearing at an earlier age and begin employment in the United States as soon as possible. Finally, evidence from other countries suggests that a higher risk of first birth among immigrant women is due to the fact that migration and family formation are often connected events (Andersson 2004, Andersson and Scott 2005, Milewski 2007). Whatever the motivation, the apparent absence of a delay in the first birth in the United States suggests that couples are able to accommodate themselves in their new destination rapidly. Well-established migration networks likely play a large role in facilitating this accommodation.

After the first birth, the tempo of childbearing in the United States slows considerably compared to childbearing in Mexico. Cumulative experience in the United States is associated with lower fertility among women in the United States and among

women who return to Mexico. However, husband's cumulative migration experience does not appear to have an impact on fertility apart from the immediate effect of separation. Lindstrom and Giorguli (2002) found a similar result and suggested that men and women reacted differently to their experiences in the United States. Men are less receptive than women to low-fertility norms and values in the United States that challenge traditional, patriarchal gender roles and family relations.

Consistent with the gender-specific results for cumulative experience, we also found that women who lived in communities where women's migration to the United States was widespread had lower than expected fertility, whereas a high prevalence of men's migration was associated with higher than expected fertility. Women who migrate to the United States and adopt low-fertility practices dominant in the United States diffuse low-fertility values and behaviors back to their communities of origin through long-distance communication and return visits (also see Lindstrom and Muñoz-Franco 2005 for a similar result in Guatemala). However, a high prevalence of men's U.S. migration is associated with a higher risk of men's solo migration to the United States and a lower risk of wife's migration.

We also found evidence of selectivity. Couples enter into migration with established preferences and family size goals that influence not only the decision to migrate, but also subsequent decisions about the type and timing of migration. We found strong evidence that couples who migrate to the United States and settle there are selected for lower fertility compared to non-migrant and return-migrant couples in Mexico. Controlling for background characteristics, couples from the U.S. sample are at a lower risk of birth in a given year than non-migrant couples in Mexico both before and after they migrate to the United States. However, a preference for large families, measured by average fertility in the community of origin, is associated with a significantly higher risk that couples in the United States return back to Mexico. This is the first study of which we are aware that has used fertility levels in the community of origin to proxy family-size preferences and that has identified a significant relationship between preferences for large families and return migration to Mexico. One of the implications of the findings of selectivity is that decisions about remaining in the United States or returning to Mexico are not entirely an outcome of the migration process but rather are also influenced by childrearing and family-size preferences established at the outset of migration.

An innovative aspect of this study is the treatment of couples as the unit of analysis and the definition of the distinct couple migration states, which allow for all possible configurations of husbands and wives on either side of the border. We feel that this treatment provides a more realistic depiction of married men's and women's migration behavior than studies which treat husband's and wife's migration as distinct events, and we see it as especially important for understanding the interrelationship

between fertility and migration. The likelihood of husband's and wife's migration changes in a closely synchronized pattern in response to the occurrence and timing of births and to the location and migration of one another. Husband's and wife's characteristics also have an influential role in determining the likelihood of each other's migration as well as their own.

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