THE IMPACT OF U.S. MIGRATION ON MEXICAN CHILDREN'S EDUCATIONAL ATTAINMENT

William KANDEL

Economic Research Service, USDA
Washington, D.C. 20036, USA

Abstract

Few studies have quantitatively examined whether the intended beneficiaries of temporary labor migration – typically children and spouses migrants leave behind – experience improved socioeconomic outcomes beyond higher levels of consumption. In this analysis, I examine the impact of labor migration on children's educational attainment. Although remitted earnings are significantly higher than earnings from domestic employment in rural communities, labor migration produces conflicting and often negative influences on children's educational progress.

I apply event history analysis to match household and personal characteristics across years in which Mexican children attended school to see how international and internal migration within the household affects the likelihood they leave school. The data come from randomly selected household surveys in three distinct communities in a migrant-sending Mexican state. I specifically isolate the financial impact of U.S. migration and also consider the impact of migrant destination, sibling versus household head migration, recent trips versus accumulated migration experience, and children's own experience in the U.S. during schooling.

Keywords: *Mexico, United States, Labor migration, Children's educational attainment.*

1. Introduction

Does international migration improve the welfare of migrants' children who grow up in migrant-sending countries? Many interviewed migrants and much of the popular press assumes that it does. The vast quantity of remitted earnings flowing into developing countries implies that labor migration benefits individuals, families, and communities. Estimates of annual remittances and savings entering Mexico range from $2 to $5 billion, rivaling earnings from export agriculture, petroleum, and tourism (Massey and Parrado, 1994; IMF, 1998). However, very little research examines whether the intended beneficiaries of labor migration – the children and spouses migrants leave behind – experience improved socioeconomic outcomes beyond higher levels of consumption. Moreover, Mexico-U.S. labor migration produces conflicting and often negative influences on children's educational progress. Significantly increased household income allows parents to purchase more schooling and reduces paid and unpaid child labor, but few migrants or their families are prepared for the consequences of such separation, including the absence of the traditional disciplinarian, a shift of adolescents' orientation from the Mexican to the U.S. labor market, misspending of U.S. earnings, intra-familial stress, and marital disintegration. In effect, temporary labor migration often presents potential hurdles for migrants attempting to translate its potential benefits into improved long-term household welfare.

In this analysis, I use event history analysis to match household and personal characteristics across years in which Mexican children attended school to see how international and internal migration within households affects the likelihood children leave school. I specifically isolate the financial impact of U.S. migration and examine its impact on children's education. I consider the impact of migrant destination, and test whether what we know about the educational implications of internal migration affects children's educational outcomes. My analysis compares sibling with household head migration, as well as recent with cumulative migration experience. I also examine the impact of children's own prior U.S. experience.

2. Prior research

Two pertinent bodies of scholarship yield opposing answers to the research question posed above. The first examines economic impacts of international labor migration. Micro-level studies suggest that remitted earnings from international migration positively affects household outcomes including outcomes for children's education (Taylor, 1987; Jones, 1995). Studies on internal migration generally find the opposite effect due, in part, to variation in broader economic contexts (Goza *et al.*, 1993; Zoller-Booth, 1995, 1996). However, these studies are often based upon small samples of residents from a single community, restricting the application of rigorous quantitative methodology and limiting the generalizability of the findings.

A second body of literature considers micro-level behavioral outcomes resulting from parental absence and the prevalence of community-level migration. In the U.S., studies have demonstrated the disadvantages for children growing up in single-parent households, including poor school performance. Causal mechanisms include lower incomes (Garfinkel and McLanahan, 1986), incomplete family socialization, and lack of parental attention (Krein and Beller, 1988; Astone and McLanahan, 1991). Effects may vary depending upon the age at which events were experienced (Chase-Lansdale and Hetherington, 1990) as well as the salience of intervening variables such as race and ethnicity, parents' education, and children's study habits (Mulkey *et al.*, 1992). In developing countries, these effects may be offset by intra-household resource distribution (Bruce and Dwyer, 1988; Lloyd and Blanc, 1996) and the role of extended family members (Buvinic, 1990). Such research, however, does not consider the case of labor migration where parental absence is temporary and where economic impacts from international migration lead to sharp improvements in socioeconomic outcomes.

Ethnographic research in Mexican migrant communities provides evidence of shifting orientations from the Mexican to the U.S. labor market (López Castro, 1986; Alarcón, 1992; Kandel and Kao, 1999) and the development of a self-sustaining 'culture of migration' or dependency among migrants for higher levels of consumption (Reichert, 1981, 1982; Kandel and Massey, 2002). This work suggests that education in Mexico and U.S. migration compete as alternative paths to economic mobility.

3. The context of education and migration in rural Mexico

Schooling in Mexico is centralized at the federal level. Students progress through *primaria* (primary school, grades 1-6), *secundaria* (middle school, grades 7-9), and *preparatoria* or *tecnica* (high school, grades 10-12). Although compulsory schooling was extended from six to nine years in 1993, direct and indirect costs of education often restrict parents' ability to comply with the law. Consequently, it remains under-enforced, particularly in rural areas of the country (Guevara Niebla, 1992; Selby *et al.*, 1990). Moreover, despite the extraordinary expansion of education in Mexico over the past five decades, problems regarding school quality and the labor market's capacity to absorb graduates from the different education levels cause parents and children to question the rationality of additional schooling (Guevara Niebla, 1992; Palafox *et al.*, 1994). Nevertheless, education offers a path to economic mobility in Mexico, and investments in education pay off in more advanced occupations and higher pay (Psacharopoulos *et al.*, 1996; Smith and Metzger, 1998).

Mexican migration to the U.S., on the other hand, frequently involves temporary labor migration by the household head or older siblings. Motives range from one-time visits by target-earners facing financial emergencies to repeat migrants with established jobs and social networks in the U.S. One of the benefits of migration is the relaxation of household budget constraints that Mexican parents frequently claim prevents their children from continuing their schooling (Kandel, 1996). Although nine years of public education are tuition free, education-related expenses such as uniforms, books, supplies, and parents' association fees begin as early as kindergarten. By the time students reach the sixth grade, opportunity costs to families of keeping their children in school also become significant, particularly in rural communities. One would therefore expect that remittances from international labor migration would have a positive, direct impact on educational attainment as well as on educational performance and aspirations within migrant households and communities.

Temporary migration also involves significant costs. Although Mexican society has undergone dramatic social and political changes during the past three decades, well-defined family roles still characterize household behavior in Mexico, especially in rural areas (Peñalosa, 1968; Iturriaga, 1994). Fathers are popularly seen as the family disciplinarians, mothers the care-givers in charge of the children's upbringing and educa-

tion. When fathers are absent, mothers find themselves in unfamiliar roles, and teachers note that children's misbehavior often increases (Kandel, 1996). Social workers cite increased marital stress by both partners, misspending of remitted funds, the absence of the traditional disciplinarian, over-compensating leniency by the mother, and emotional distance of children from their father as problems which affect children's educational performance, aspirations, and attainment.

In addition, the prevalence of migration within households and communities offers the prospect of an alternative to education for economic mobility. This alternative has implications for educational attainment in Mexico due in part to a peculiar trait of the U.S. labor market; education in Mexico is not rewarded economically to the same degree as education acquired in the U.S. New labor market entrants with the equivalent of a high school education can obtain remunerative clerical, administrative or even profession work without having to consider the alternative of U.S. migration and its attendant hardships, legal and economic risks, and low status (Kandel, 1996; Massey *et al.*, 1987). In migrant communities, in contrast, it is generally understood that additional schooling in Mexico has little impact on one's labor market prospects in the U.S. compared to one's understanding of English, work experience in the U.S., social networks, and documentation (Chiswick, 1979; Massey *et al.*, 1987). Thus, if parents and children believe their futures lie in the United States – as temporary or permanent migrants – they have few incentives to invest in Mexican schooling.

4. Hypotheses: Household migration and children's education

International migration within a household has several components which affect children. Below, I discuss those measurable aspects of migration included in my analysis and hypothesize on how they might affect the likelihood of a child remaining in school. Because of data limitations, I analyze migration only within the household and not that of children's friends and neighbors. Even so, migration within the household is generally the most influential for actual migration decisions, based upon patterns of economic benefits from migration as well as reciprocal obligations that occur among family members (Espinosa and Massey, 1997).

4.1. Economic impact of migration

In the U.S., migrants often accumulate savings while sending a significant portion of their earnings back to their families in Mexico. While savings are frequently used for the acquisition of capital assets, remitted earnings typically go toward routine household financial maintenance (Massey *et al.*, 1987). Located within this broad category of '*puro sustento*' are education expenses. Remittances are expected to directly and positively affect children's education by covering schooling expenses and reducing economic pressure to leave school and begin work. Savings may have similar if indirect effects through income-generating or expense-reducing purchases, such as land and housing, respectively, but I control for these effects using a wealth index described below. *HYPOTHESIS 1: Remitted U.S. earnings are inversely related to the likelihood that a child drops out of school.*

4.2. Timing of migration

Migration histories can be characterized by the quantity of accumulated experience and the timing of migration. Both affect the 'quality' or usefulness of one's "migration capital", a dynamic asset that diminishes in value over time if not renewed. Relatively current experience implies up-to-date information about border crossing strategies, employment leads, active personal contacts, and other critical elements of successful labor migration. A retired parent with twenty years of U.S. work experience may possess less migration capital, from the perspective of a potential migrant, than a parent with two years of recent U.S. experience. Recent trips usually have limited economic impacts but imply more useful migration capital for children making decisions about additional education. *HYPOTHESIS 2: Recent migration will increase the likelihood of a child leaving school than will accumulated migration which occurred in prior but not recent years.*

4.3. Household head versus sibling migration

Two characteristics distinguish household head migration from sibling migration: relevance and economic impact. First, since household heads have more advanced careers and different motivations, time horizons, and aspirations than their children, their U.S. migration experience will not seem as relevant to children compared to that of siblings closer

in age. If parents and siblings in a household have both migrated, other children contemplating migration are more likely to gage their own prospects for successful migration and employment based upon the experience of those closer in age. Second, because migrants tend to remit to their immediate families, children are more likely to experience economic benefits of U.S. migration through the household head than that of their siblings. The latter are more likely to have their own households or may contribute less to the household economy. *HYPOTHESIS 3: Household head migration will have a more favorable impact on children's education than will sibling migration for two reasons: a greater positive financial impact which is more likely to be directed towards the child's economic welfare, and a less influential role model compared to sibling migration for children contemplating migration.*

4.4. Migration destination

Although less prevalent than U.S. migration, migration within Mexico occurs enough to consider its impact on children's education. The model in this analysis estimates the impact of internal migration by both the household head and by siblings. As noted earlier, children remaining in school beyond *primaria* obtain higher returns to educational investment from the Mexican labor market than the U.S. labor market. The presence of internal migrants within a household is likely to signal higher education levels and/or an economic status which permits and encourages educational attainment (see Todaro, 1989). Like U.S. migration, internal migration has its own associated 'migration capital' comprised of useful employment information and social contacts, and like any other labor activity, it encourages other household members to do the same because of the acquisition of specialized and valuable information, as well as the influence of older successful role models. *HYPOTHESIS 4: Migration within Mexico, either by siblings or the household head, will have a more positive influence on children's educational attainment than will migration to the U.S.*

4.5. A child's own migration

A portion of Mexican children visit or live in the U.S. during their years of schooling. Given the lack of empirical studies on this phenomenon, one might speculate that a child's exposure to the U.S. would positively or negatively influence education outcomes depending upon the circumstances of the visit, such as length of stay, location of residence,

and experience with U.S. schools and labor markets. *I make no hypothesis regarding the impact of this variable but include it in the model for empirical completeness.*

5. Data and methodology

Data for this analysis come from surveys conducted for the Mexican Migration Project (MMP) of the University of Pennsylvania and the Universidad de Guadalajara. Questionnaires were administered to 725 randomly selected households in three distinct communities in the central Mexican state of Zacatecas: Zacatecas, the capital city, Jerez, a large commercial town, and Las Uvas, a fictitious name for a rural village near Jerez. Data was collected for Zacatecas in 1994-95, and for Jerez and Las Uvas, in 1995-96. Although the state is relatively poor with extensive U.S. migration (Dagadog, 1975; Durand *et al.*, 2000), international migration is not a forgone conclusion for educated residents living in the southern part of the state. This area is more economically developed and borders the states of Jalisco, Aguascalientes, and San Luis Potosí, whose capital cities all possess large urban labor markets.

Sites were selected for proximity to each other and to educational and employment centers. Moreover, their sharply contrasting characteristics affect how residents value schooling and allow for more generalized findings. Zacatecas (1995 population, 175,000) has numerous primary and secondary schools, several colleges and universities, low rates of U.S. migration, high rates of internal migration, and a relatively active labor market. Jerez (1995 population, 37,000) lies within commuting distance of Zacatecas and Fresnillo and serves as county seat and commercial center for surrounding agricultural communities. It offers schools and technical training through the high school level, and its location allows residents to work or study in neighboring cities. Nevertheless, Jerez has a long tradition of U.S. migration which permeates the local culture and economy. Las Uvas (1995 population, 1,200) is typical of rural agriculturally-based villages in the state. It is located off of a highway that connects Jerez and Fresnillo, and some residents work and study in these nearby cities. Many in Las Uvas do not possess enough land to sustain themselves through agricultural production, and U.S. labor migration is endemic.

Surveys were administered with the help of two trained Mexican research assistants during winter months when U.S. migrants were likely

to spend the holidays in Mexico. We sampled the three communities using two different sampling methodologies. The first method uses MMP methodology which involves surveying randomly selected occupied households using a census of all houses in representative neighborhoods of each site (or all dwellings, in the case of Las Uvas). This method yielded a sample of 558 households. The rate of refusal remained under 10 percent for all three communities and was due more to suspicion of outsiders than a systematic concern about revealing migration information.

The second method involved selecting previously surveyed students at random, with the intention of eventually merging student and household survey data for future analyses. Therefore, in each community, we randomly selected completed student surveys and obtained these students' addresses from school administrators. The procedure yielded an additional 167 households, increasing the sample size to 725 and boosting the statistical power of the analysis, but it also introduced the following biases. Surveyed students are present in school and are likely to be self-selected for their parents' and their own academic inclinations, some of which may reflect higher SES or greater interest in education. In addition, a third of the addresses given to us by administrators were incorrect, and we compensated by selecting alternate random households. It remains to be seen how the exclusion of these selected cases may bias the results. Nevertheless, after rerunning the analysis without these additional cases, I found no significant differences in the values, standard errors, or significance levels of the coefficients. Therefore, I include all cases and control for the school-based selection method in the model.

Following the MMP's enthnosurvey methodology, we solicited from the household head demographic, social, and economic data for all members of the household, regardless of age or current residence (Massey *et al.*, 1987). Migration history data on the first and last trips were obtained for anyone in the household who had ever been to the U.S. Household heads were asked to provide detailed life-history data on employment, marriage, property ownership, border crossings, and their most recent U.S. trip.

This analysis can be viewed as a form of demographic survival analysis where 'death' is dropping out of school. The analysis uses data for all children in these 725 households and follows their educational history from the time they entered primary school until the year they completed their schooling. The education histories terminate in three ways: right-

censorship for currently enrolled students, schooling completion, or reaching age 25.

An event-history file was thus constructed for each child, matching personal, parental, and household characteristics for each year the child was in school. For example, in the first year of a child's education history, the child is age six, has zero years of completed schooling, is enrolled in *primaria*, and has not experienced the event of leaving school. If the child completes only *primaria*, she will have a seven year history, with the seventh year registering an age of 12, six years of completed schooling, enrollment in *secundaria*, but with the experience of the event of leaving school that annuls the effect of the enrollment. This treatment of leaving school does not distinguish between students completing one academic level without entering the next and those entering the next academic level who leave during their first year. However, because the unit of analysis is person-years, this inability to distinguish between these two patterns is not likely to have a significant impact. Children of any age who had never entered school were eliminated from the analysis, because they never entered the risk group for leaving school. Of the 3,274 children captured by the MMP Surveys, 301 or 9.2 percent never entered *primaria*, mostly because they were under age six. Because the MMP Survey includes children as old as 66, the majority of the sample consists of children no longer enrolled.

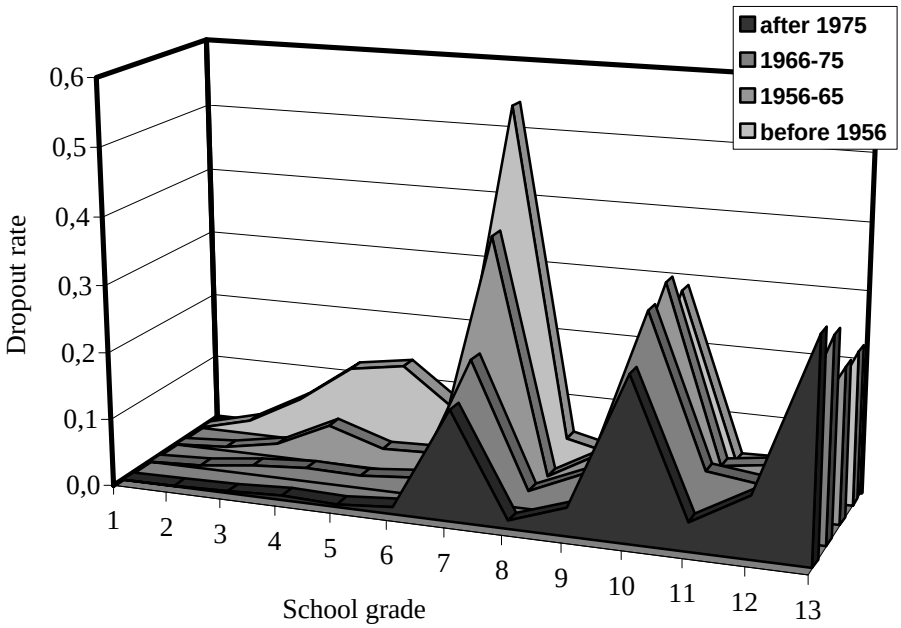
The analysis relies on several assumptions. First, all currently and formerly enrolled children are assumed to begin primary school at age six. Based upon the starting age distribution of another data set of 7,600 student surveys (see Kandel and Kao, 1999), this assumption appears reasonable. Next, because of data limitations, the model does not control for prolonged interruptions in schooling or grade repetitions. According to data from the student surveys noted above, 21 percent of students repeated a grade – usually first grade – and 7.5 percent took a leave of absence from school, typically for one to two years. Results from the cited analysis show a negative correlation between grade repetition and academic aspirations. Although there is little support in the education literature for a causal relationship between grade repetition and future educational outcomes, the omission of a measure of grade repetition may slightly bias outcomes for a small portion of the sample.

Two advantages of event history analysis over conventional statistical methods are its ability to deal with censoring (e.g. children who were still in school at the time of the survey) and time-dependent independent

variables. More importantly, event history analysis orders events according to when they occurred, which yields greater assurance about the direction of causality.

I use a non-proportional odds model known as complementary log-log. It treats one of the more problematic assumptions of the standard logit model, namely the occurrence of 'tied' events which occur within the same unit of time measure (Allison, 1995). Standard errors and test statistics were adjusted for household clustering using the method of White (1982). The model produces logit coefficients directly interpretable as positive or negative impacts. The following transformation converts coefficients to changes in odds: *Percentage change in the odds of an event = 100% x (exp(coefficient) - 1)*

Figure 1
Dropout rates for four birth cohorts
by school grade



Dropout rates by birth cohort for each school grade are displayed in Figure 1. They are computed by dividing the number of dropouts by the number of children enrolled. The event of dropping out occurs prior to enrollment in the following grade; children who drop out in 7th grade as shown in Figure 1 have graduated from 6th grade and did not enter 7th grade. Figure 1 illustrates that dropout rates, which escalate at the academic junctures of 6th, 9th, and 12th grades, have shifted over time with increased educational expansion in Mexico over the past 50 years (García and Suárez Zozaya, 1994). Compared to older birth cohorts, children born after 1975 are more likely to leave school after grade 12 and less likely to drop out after grade 6. The opposite is true for children born before 1956. Nevertheless, Figure 1 indicates that patterns of leaving school are similar for all children in the sample, insofar as they occur primarily at one of three critical junctures. Literature on Mexican education suggests that these three academic levels represent distinct enough phases in children's life histories (see Prawda, 1987; Levinson, 1999) to be evaluated separately for determining the impact of U.S. migration on educational attainment.

Running models separately by child characteristics such as academic level or gender may provide useful results if these divisions are justified. Balancing the addition of new information, however, is the loss of statistical power. I evaluated this trade-off by conducting a series of preliminary analyses. First, I ran separate models by sex and found surprisingly little difference in the size or significance levels of all covariates to justify separate models. Next, I ran an extensive series of models to test for differences by academic levels. These included interaction terms for academic levels and grade levels with each migration variable, as well as separate models by academic levels. Few enough interaction terms were significant to suggest that U.S. migration affects leaving school differently at different academic levels. I therefore concluded that the most effective way to model the likelihood of leaving school was to include all cases in the model and control for each grade.

Table 1 presents variable descriptions, means, and standard deviations. Covariates are divided into migration-related and control variables. Missing values accounted for a fraction of a percent of the cases for any given variable and were assigned the more conservative of the mean or median values of known values, based upon sex, community, age cohort, or some combination of the three. One exception was parental education levels in single parent households; they constitute nine percent of all

households in the sample and are generally headed by women. Because parents' education is a critical variable, I chose not to drop a large portion of my cases and used mean values of schooling based on age of spouse, sex of missing spouse, and community for cases for which I had complete information.

Table 1
Means and standard deviations of variables

Variables	Mean	S.D.
Child drops out of school	0.065	0.247
Migration variables		
Child has ever been to U.S.	0.033	0.179
A sibling made a U.S. trip within past three years	0.093	0.291
A sibling made a Mexico trip within past three years	0.023	0.150
Household head made a U.S. trip within past three years	0.148	0.355
Household head made a Mexico trip within past three years	0.035	0.184
U.S. experience of household head since three yrs. ago (months)	15.710	40.363
Estimated remittance of household head if in U.S.	8.422	29.295
Area of residence		
Las Uvas: village	0.158	0.365
Jerez: large town	0.361	0.480
Zacatecas: city (reference category)	0.482	0.500
School selected case	0.233	0.423
Household characteristics		
Wealth Index in person-year	1.740	1.688
Single parent household in person-year	0.069	0.254
Number of older siblings in person-year	2.626	2.532
Number younger siblings in person-year	2.246	1.722
Mother's years of schooling		
0-5 years (reference category)	0.547	0.498
6-8 years (primaria)	0.287	0.452
9+ years (secundaria+)	0.166	0.372
Father's years of schooling		
0-5 years (reference category)	0.484	0.500
6-8 years (primaria)	0.297	0.457
9+ years (secundaria+)	0.219	0.413

.../..

Other characteristics of child		
Born before 1956	0.101	0.301
Born between 1956-1965	0.201	0.401
Born between 1966-1975	0.364	0.481
Born after 1975 (ref. category)	0.334	0.472
Female	0.495	0.500
Grade 1	0.119	0.324
Grade 2	0.118	0.322
Grade 3	0.114	0.318
Grade 4	0.109	0.312
Grade 5	0.102	0.303
Grade 6	0.096	0.294
Grade 7	0.088	0.283
Grade 8	0.062	0.241
Grade 9	0.058	0.233
Grade 10	0.050	0.218
Grade 11	0.033	0.178
Grade 12	0.028	0.166
Grade 13 (reference category)	0.020	0.15
Number of cases (person-years)	24,292	

Seven variables related to international and internal migration were constructed to measure different facets of migration while avoiding multicollinearity. The first variable takes and retains for all subsequent years the value of 1 from the year the child has any experience in the U.S. prior to leaving school. I assume that the experience is sufficiently important – either symbolically or because of legal status implications – to remain an influence throughout the child's education history. This is especially true for those born in the U.S. or who traveled to the U.S. within a few years prior to leaving school. The former have legal status in the U.S. which affects how they value education in Mexico, and the latter have a powerful recent experience to evaluate when considering occupational alternatives. For those who have greater numbers of years between their migration experience and their dropout year, the variable may not accurately reflect depreciation of the experience over time. The second and third variables indicate whether any sibling took a trip to the U.S. or internally within the past three years of the person-year. The fourth and fifth variables similarly measure recent international and internal migration for the household head. The sixth migration variable represents

months of accumulated U.S. experience of the household head from his or her very first trip until three years prior to the person-year.

The seventh variable is an estimate of monthly U.S. remitted earnings for any given year in which the household head made a U.S. trip. This variable was computed as follows. First, monthly remittance amounts for all migrants reporting remittances were converted to logged constant 1990 U.S. dollars. These amounts were estimated using household head characteristics which included: duration of most recent trip, age of household head when trip was initiated, number of prior U.S. trips, legal status, years of schooling, and gender. The resulting equation was then used to estimate a monthly remittance amount which was exponentiated and included in the model.

The model controls for community context, with the city of Zacatecas as the omitted category. At the household level, I control for wealth with an index that includes house, farmland, lot, and business ownership. The index, reflecting the acquisition or sale of assets over the course of the child's education history, ranges from 0 to 17, with a value of 1 assigned to each asset. To make assets roughly equivalent, houses were divided into high and low quality, land was divided into less and more than four hectares, and land plots with houses were differentiated from those without. Household wealth may indicate higher socioeconomic standing or the tying or freeing up of remittances which could be applied toward educational expenses.

The model controls for whether the household was headed by a single parent under the assumption that a missing parent would affect the household members economically or psychologically in ways affecting educational attainment. The model also controls for resource dilution and labor contributions of siblings with variables for number of older and younger siblings in the person-year (Blake, 1989). Education levels of both parents are included using dummy variables for having completed *primaria* or *secundaria* and beyond, with less than six years of schooling as the reference category. The model also controls for children's sex and birth cohort. Because some MMP surveys from Zacatecas were conducted as early as 1994, I selected the most recent age cohort as those born after 1975, a range of 19 years to the survey date. Other birth cohorts were selected at ten year intervals from 1975. The presence of grade dummy variables effectively controls for children's ages.

6. Results

Results are shown on Table 2 and they support several of the hypotheses. None was made about the impact of a child's own U.S. experience on leaving school, and the results indicate a reduction in the likelihood of leaving school. Although such a relationship might appear counter-intuitive, it accords with a related study of academic aspirations which uses student survey data collected during the same period of fieldwork (Kandel and Kao, 1999). The most likely explanation is that students with early U.S. experience prior to beginning their labor histories come from households with sufficient resources to visit the U.S. as tourists. A variant of this explanation is that with greater exposure to the U.S. education system and labor market, they are less likely to take a parochial view of schooling in Mexico. Many Mexican parents recognize the value of knowing English to secure employment in the U.S. as well as in Mexico, and, circumstances permitting, they will migrate as a family early in the family's life-cycle so that their children acquire language skills at a young age.

Table 2
Coefficients from logistic regression
predicting a child will drop out of school

Variables	Coef.	S.E.
Migration variables		
Child has ever been to U.S.	-0.423 *	0.183
A sibling made a U.S. trip within past three years	0.227 **	0.090
A sibling made a Mexico trip within past three years	-0.493 **	0.164
Household head made a U.S. trip within past three years	0.076	0.099
Household head made a Mexico trip within past three years	-0.147	0.166
U.S. experience of household head since three yrs. ago (months)	-0.004 **	0.001
Estimated remittance of household head if in U.S.	0.000	0.001
Area of residence		
Las Uvas: village	1.232 **	0.111
Jerez: large town	0.534 **	0.106
Zacatecas: city (reference category)	---	---
School selected case	-0.551 **	0.100

…/…

Household characteristics			
Wealth Index in person-year	-0.070	**	0.023
Single parent household in person-year	0.130		0.125
Number of older siblings in person year	-0.040	*	0.016
Number younger siblings in person year	-0.001		0.025
Mother's years of schooling			
0-5 years (reference category)	---		---
6-8 years (primaria)	-0.408	**	0.092
9+ years (secundaria+)	-0.850	**	0.173
Father's years of schooling			
0-5 years (reference category)	---		---
6-8 years (primaria)	-0.476	**	0.103
9+ years (secundaria+)	-1.133	**	0.156
Other characteristics of child			
Born before 1956	0.598	**	0.155
Born between 1956 - 1965	0.194	*	0.096
Born between 1966 - 1975	0.211	**	0.076
Born after 1975 (ref. category)	---		---
Male	0.113	*	0.055
Grade 1	-18.558	**	0.141
Grade 2	-4.705	**	0.370
Grade 3	-3.496	**	0.265
Grade 4	-2.753	**	0.177
Grade 5	-2.923	**	0.215
Grade 6	-2.939	**	0.198
Grade 7	-0.387	**	0.118
Grade 8	-2.774	**	0.195
Grade 9	-1.852	**	0.167
Grade 10	0.045		0.107
Grade 11	-1.421	**	0.170
Grade 12	-1.353	**	0.175
Grade 13 (reference category)	---		---
Intercept	-0.71	**	0.192
-2 x log likelihood	7831.86	**	

* p < .05 ** p < .01

Later, before the oldest children reach adolescence, the family will often return to Mexico where teenagers grow up in a more traditional and supervised environment (Kandel, 1996).

In contrast, U.S. migration by a sibling increases the likelihood of leaving school. The result supports the hypothesized negative impact of

sibling migration on children's education, which I argue is the result of an example of an alternative mobility path by someone close in age. An alternative explanation is that sibling migration increases the need for paid and unpaid work by other children that increases the likelihood they will terminate schooling. The data do not include measures of part-time paid or unpaid work, but the student survey data described previously indicate a small but significant correlation (0.07) for male students between having a sibling currently in the U.S. and hours of unpaid domestic help during the prior week.

Were this explanation correct, we would expect to see the same results for sibling trips made within Mexico. Although different in character, duration, and financial impact, internal migration trips also deprive households of unpaid labor. Nevertheless, Table 2 indicates that such trips are associated with a reduced likelihood a child will leave school. The result supports the hypothesis that internal migration by siblings is associated with higher education levels and interest in education, either by siblings or within households. Moreover, the student survey data indicate no impact of internal sibling migration on hours of paid or unpaid work by male or female students. Student survey data has the weakness of selectivity; children who leave school do not appear in the sample. Nevertheless, we would expect to see differences in labor activity for working students, and this is not the case.

The results for recent trips by household heads are insignificant, although the signs and sizes of the coefficients support the hypothesis of lower parental influence for recent trips. The lack of statistical significance cannot be attributed to the greater likelihood of sibling trips compared to household head trips, even though the mean number of children is five in the surveyed region; Table 1 indicates that household heads have a greater frequency of internal and international trips compared to all siblings.

Recent parental trips are strongly associated with prior patterns of migration, and it is the latter which is significant. As hypothesized, prior migration experience, which reflects accumulated wealth – a positive influence for children's education outcomes – lowers the likelihood of a child leaving school. Transforming this coefficient into odds coefficients, the results suggest that each month of U.S. experience by the household head reduces the odds of a child leaving school by 0.4 percent, and each year reduces the odds by about 5 percent. Such a result needs further analysis to ascertain to what extent of household head migration this

relationship holds, particularly for migrants with extensive migration histories.

After controlling for the variants of U.S. and internal migration above, as well as household wealth, the variable for estimated monthly remittance amount has no significant impact. Two reasons may explain this. First, when included in the model without other migration variables, it approaches significance in the expected direction. This suggests that other migration variables – in particular, prior U.S. experience – are capturing economic effects of migration, as indicated by a correlation coefficient of 0.41 between these two variables. Second, household wealth may also capture this economic impact, and dropping it from the model increases the significance level of the remittance coefficient. Nevertheless, it should be noted that removing migration variables individually from the analysis did not markedly alter the size or significance of the other migration variable coefficients.

Results for control variables behave as expected. At the community level, residence in Las Uvas or Jerez strongly and significantly increases the likelihood of leaving school compared to residence in Zacatecas; in the smaller communities, education levels are lower, options are fewer, labor demands are greater, and U.S. migration is far more prevalent.

Being in the school-selected sample is negatively associated with leaving school, reflecting a self-selection process found for students who attend school and respond to surveys compared to those who do not. In addition, since many of the addresses given to us by school administrators for these cases were incorrect, the surveyed cases may indicate greater conscientiousness on the part of parents that is associated with a stronger interest in schooling.

At the household level, accumulated wealth reduces the likelihood of leaving school, and given its modest but significant correlation of 0.14 with accumulated migration experience, it supports the positive economic effect of migration on education, as well as positive impacts described in the education literature. While the presence of younger siblings has no impact on the likelihood of dropping out, the existence of older siblings reduces it. This result supports the traditional contention of some parents that the eldest children have a greater obligation to leave school early to contribute to household support. Living in a single parent household has no significant impact on the likelihood children leave school, although the sign of the coefficient is in the right direction. The impact of parental education behaves as expected for mothers and fathers.

The results for children's birth cohorts reflect educational expansion in Mexico over the past 40 years, with older cohorts of children having significantly higher probabilities of leaving school compared to the most recent reference category of children born after 1975.

Male students have a greater likelihood of leaving school. However, this result tends to vary across childen's academic levels. Female students in general exhibit more positive academic outcomes (e.g. grades, aspirations, days absent) compared to their male counterparts. This results partly from socialization and partly from labor force demands placed on boys at earlier ages (Kandel, 1996). However, at the *preparatoria* level, female students tend to have higher dropout rates because of marriage, and rural females at all levels tend to drop out earlier because of household resource allocation patterns favoring future male breadwinners. Finally, in the past, social norms may have discouraged additional education for women that made them less attractive marriage partners.

Finally, the grade variables exhibit fairly consistent results; children enrolled at all grade levels exhibit lower likelihoods of dropping out of school compared to those with 12 years of schooling completed (grade 13), and the magnitude of the effect declines with higher grades. The very large value for children in grade 1 simply reflects the few cases of children with zero years of schooling who actually were enrolled.

7. Discussion

In this analysis, I overcame constraints of other studies by modeling educational outcomes using retrospective data which time-orders events and characteristics of interest. I analyzed the impact of five facets of international and internal migration on the likelihood that Mexican children would leave school: the economic impact of migrant remittances; recent versus older accumulated migration; household head versus sibling migration; internal versus international household migration; and a child's own U.S. migration.

The results for the financial impact of U.S. migration, operationalized as estimated monthly remittances, had no apparent impact on children's likelihood of leaving school. Although I constructed this variable in such a way to reduce multicollinearity with the two other variables measuring U.S. migration by the household head, some overlap in measurement still occurs. When the model is run without including the prior

experience of the household head and without an indicator of a recent U.S. trip by the household head, the variable for remittances is negative and approaches significance, as expected.

The results for U.S. experience of the household head accumulated since the first trip until three years prior to the person-year in the analysis, provide support for my hypothesis that prior migration experience is positively associated with children's educational attainment. As measured in this analysis, such prior migration embodies the economic benefits without the drawbacks of U.S. migration, because a significant amount of the household head's migration experience may have occurred earlier in the family life cycle, often before the household head's children are born. Consequently, its effect due to parental absence may be minimal, while its economic impact – particularly if U.S. earnings are invested in housing, vehicles, or land – continue to be felt throughout childhood.

Also as hypothesized, U.S. migration by the household head has a more benign effect on the likelihood that children will leave school than does U.S. migration by a sibling. I argue that recent experience by the father acts as less of an impetus for the child to leave school, when compared to sibling migration. The latter provides a role model for migration success for someone closer in age and circumstance, thereby providing more realistic basis for forming expectations and making decisions about employment prospects in the U.S.

The same appears to be the case for trips within Mexico. Sibling internal migration was found to impact positively children's educational attainment, while sibling international migration had the opposite effect. This finding has support in the empirical literature on internal migration in developing countries.

I made no hypothesis about a child's own migration. The result for this variable was a positive outcome which reduced the likelihood of leaving school. The overwhelming majority of children with U.S. migration experience prior to completing their schooling come from Jerez and Las Uvas. One explanation for this positive effect is that parents who expose their children to the U.S. but raise them in Mexico have strong preferences for education that surpass the influences of migration which discourage additional schooling. It may also signal a certain degree of family unity that can support migration as a complete unit.

The connection between international labor migration and family welfare is not well understood; no studies have been dedicated solely to children's educational outcomes, and few examine to what extent chil-

dren in developing countries reproduce the migration, employment, and family formation patterns of their parents. The consequences of ignoring this phenomenon are significant. Remitting earnings offers migrants a rather unique opportunity to improve the welfare of their families over the long-term, thereby ensuring that their children have more choices than those offered by low skilled labor markets in Mexico and the U.S. Understanding how families can be economically supported from international labor migration while minimizing its minimum negative impacts is a relevant and important issue for many countries. In addition, improving education policies in developing countries requires an understanding of young people's incentives and motivations, particularly in international migrant communities where incentives for education may be particularly confounded.

References

ALARCÓN, R. (1992), "Norteñización: Self-perpetuating migration from a Mexican town", in: J. Bustamante, R. Hinojosa and C. Reynolds, eds., *U.S.-Mexico Relations: Labor Market Interdependence*, Stanford, California, Stanford University Press, p. 302-318.

ALLISON, P. (1995), *Survival Analysis Using the SAS System*, Cary, North Carolina, SAS Institute.

ASTONE, N., and S. MCLANAHAN (1991), "Family structure, parental practices, and high school completion", *American Sociological Review*, vol. 56, p. 309-320.

BLAKE, J. (1989), *Family Size and Achievement*, Berkeley, University of California Press.

BLAU, P., and O. DUNCAN (1967), *The American Occupational Structure*, New York, Wiley.

BRUCE, J., and D. DWYER (1988), *A Home Divided: Women and Income in the Third World*, Stanford, California, Stanford University Press.

BUVINIC, M. (1990), "The vulnerability of woman-headed households: Policy questions and options for Latin America and the Caribbean", Working paper prepared for the Economic Commission for Latin America and the Caribbean, Conference on Vulnerable Women, November 26-30, Vienna.

CHASE-LANSDALE, L., and E. HETHERINGTON (1990), "The impact of divorce on life-span development: Short and long term effects", in: P.B. Baltes, D.L. Featherman, and R.M. Lerner, eds., *Life Span Development and Behavior*, vol. 10, Hillsdale, New Jersey, Erlbaum, p. 105-150.

CHISWICK, B. (1979), "The economic progress of immigrants: Some apparently universal patterns", in: W. Fellner, ed., *Contemporary Economic Problems 1979*, Washington D.C., American Enterprise Institute for Public Policy Research, p. 359-399.

CRAIG, J.E. (1981), "The expansion of education", *Review of Research in Education*, vol. 9, p. 151-169.

DAGADOG, W. (1975), "Source regions and composition of illegal Mexican immigration to California", *International Migration Review*, vol. 9, p. 499-511.

DURAND, J., W. KANDEL, E. PARRADO, and D. MASSEY (1996), "International migration and development in Mexican communities", *Demography*, vol. 33, p. 249-264.

DURAND, J., D. MASSEY and F. CHARVET (2000), "The changing geography of Mexican immigration to the United States: 1910-1996", *Social Science Quarterly*, vol. 81, p. 1-15.

ESPINOSA, K., and D. MASSEY (1997), "Undocumented migration and the quantity and quality of social capital", *Soziale Welt*, vol. 12, p. 141-162.

GARCÍA MUÑOZ, H., and D. SUÁREZ ZOZAYA (1994), *Perfil Educativo de la Población Mexicana*, Aquascalientes, Ags., INEGI.

GARFINKEL, I., and S. MCLANAHAN (1986), *Single Mothers and Their Children: A New American Dilemma*, Washington, D.C., Urban Institute Press.

GUEVARA NIEBLA, G. (1992), "El malestar educativo", *Nexos*, vol. 15, p. 21-36.

GOZA, F., E. RIOS-NETO and P. VIEIRA (1993), "Consequences of temporary out-migration for families left behind: The case of Jequitinhonha Valley, Brazil", in: *Internal Migration of Women in Developing Countries*, New York, United Nations.

GRINDLE, M. (1988), *Searching For Rural Development*, Ithaca, Cornell University.

IMF (1998), "Balance of payments", *Statistics Yearbook*, Washington, D.C., IMF.

INEGI (Instituto Nacional de Estadistica Geografia y Informatica) (1993), "Caracteristicas educativas", Aguascalientes, Ags., INEGI.

ITURRIAGA, J. (1994), *La Estructura Social y Cultural de México*, Mexico City, Fondo de Cultura Económica.

JONES, R. (1995), *Ambivalent Journey: U.S. Migration and Economic Mobility in North Central Mexico*, Tucson, Arizona, University of Arizona Press.

KANDEL, W. (1996), "The impact of international labor migration upon educational attainment within Mexican migrant households: Preliminary qualitative results from fieldwork", Paper presented at the *Coloquio Internacional: Las Relaciones Mexico-Estados Unidos Desde La Perspectiva Regional*, August, 1996, San Luis Potosí, SLP, Mexico.

KANDEL, W., and G. KAO (1999), "Shifting orientations: How U.S. labor migration affects children's aspirations in Mexican migrant communities", *Social Science Quarterly*, vol. 81, no. 1, p. 16-32.

KANDEL, W., and D. MASSEY (2002), "The culture of Mexican migration: A theoretical and empirical analysis", *Social Forces*, vol. 80, no. 3, p. 981-1004.

KREIN, S., and H. BELLER (1988), "Educational attainment of children from single-parent families: Differences by exposure, gender and race", *Demography*, vol. 25, p. 221-234.

LEVINE, S., and C. CORREA (1993), *Dolor y Alegría: Women and Social Change in Urban Mexico*, Madison, Wisconsin, University of Wisconsin Press.

LEVINSON, B. (1999), "Una etapa siempre difícil: Concepts of adolescence and secondary education in Mexico", *Comparative Education Review*, vol. 43, p. 129-161.

LLOYD, C., and A. BLANC (1996), "Children's schooling in sub-Saharan Africa: The role of fathers, mothers, and others", *Population and Development Review*, vol. 22, p. 265-298.

LÓPEZ CASTRO, G. (1986), *La Casa Dividida*, Zamora, Michoacán, Mexico, Colegio de Michoacán.

MASSEY, D., R. ALARCÓN, J. DURAND, and H. GONZÁLEZ (1987), *Return to Aztlan*, Berkeley, University of California.

MASSEY, D., and E. PARRADO (1994), "Migradollars: The remittances and savings of Mexican migrants to the U.S.", *Population Research and Policy Review*, vol. 13, no. 1, p. 3-30.

MINES, R. (1981), *Developing a Community Tradition of Migration: A Field Study in Rural Zacatecas, Mexico and California Settlement Areas*, Monographs in U.S.-Mexican Studies

no. 3, La Jolla, California, Program in United States Mexican Studies, University of California at San Diego.

MULKEY, L., R. CRAIN, and A. HARRINGTON (1992), "One-parent households and achievement: Economic and behavioral explanations of a small effect", *Sociology of Education*, vol. 65, p. 48-65.

PALAFOX, J., J. PRAWDA, and E. VELEZ (1994), "Primary school quality in Mexico", *Comparative Education Review*, vol. 38, no. 2, p. 167-180.

PEÑALOSA, F. (1968), "Mexican family roles", *Journal of Marriage and the Family*, vol. 30, p. 680-689.

PRAWDA, J. (1987), *Logros, Inequidades y Retos del Futuro del Sistema Educativo Mexicano*, Mexico City, Grijalbo.

PSACHAROPOULOS, G., E. VELEZ, A. PANAGIDES, and H. YANG (1996), "Returns to education during economic boom and recession: Mexico 1984, 1989, and 1992", *Education Economics*, vol. 4, p. 219-231.

REICHERT, J. (1981), "The migrant syndrome: Seasonal U.S. labor migration and rural development in Central Mexico", *Human Organization*, vol. 40, p. 56-66.

REICHERT, J. (1982), "A town divided: Economic stratification and social relations in a Mexican migrant community", *Social Problems*, vol. 29, p. 411-423.

SELBEY, H., A. MURPHY, and S. LORENZEN (1990), *The Mexican Urban Household: Organizing for Self-Defense*, Austin, University of Texas.

SMITH, P., and M. METZGER (1998), "The return to education: Street vendors in Mexico", *World Development*, vol. 26, p. 289-296.

TAYLOR, E. (1987), "Undocumented Mexico-U.S. migration and the returns to households in rural Mexico", *American Journal of Agricultural Economics*, vol. 69, p. 626-637.

TODARO, M. (1989), "Education in developing countries", in: *Economic Development in the Third World*, New York, Longman.

WHITE, H. (1982), "Maximum likelihood estimaton of misspecified models", *Econometrica*, vol. 50, p. 1-25.

ZENTENO, R. (1998), "Crisis Economica y Determinantes de la Oferta de Trabajo Femenino Urbano en Mexico: 1994-1995", *Estudios Demográficos y Urbanos*, vol. 41.

ZOLLER-BOOTH, M. (1995), "The effects of father absence on Swazi children's preparedness for school", *Comparative Education Review*, vol. 39, p. 195-210.

ZOLLER-BOOTH, M. (1996), "Parental availability and academic achievement among Swazi rural primary school children", *Comparative Education Review*, vol. 40, p. 250-263.