

DISCUSSION PAPERS IN ECONOMICS

Working Paper No. 08-02

Gender, Educational Attainment, and the Impact of
Parental Migration on Children Left Behind

Francisca M. Antman

University of Colorado

updated June 2008, February 2010
June 2007

Center for Economic Analysis
Department of Economics



University of Colorado at Boulder
Boulder, Colorado 80309

© June 2007 Francisca M. Antman

Gender, Educational Attainment, and the Impact of Parental Migration on Children Left Behind *

Francisca M. Antman[†]

Department of Economics, *University of Colorado at Boulder*

February 5, 2010

Abstract

Estimation of the causal effect of parental migration on child education is complicated by the likelihood that factors influencing parental migration also affect child educational attainment. This paper exploits variation in siblings' ages at the time of parental migration to get around this endogeneity problem, arguing that parental migration after a child is 20 should have no direct effect on a child's educational attainment. The results point to a positive effect of paternal migration on education, but the results are gender-specific, suggesting that pushing a father's U.S. migration earlier in his daughter's life can lead to an increase in her educational attainment of up to 1 year relative to delaying migration until after she has turned 20. In contrast, paternal domestic migration has no significant effect on educational investments, suggesting that father absence does not play a major role in determining children's educational outcomes. Instead, these results suggest that the marginal dollars from remittances relax the household budget constraint and enable families to invest in girls' education. They are also consistent with the findings from the literature on intrahousehold allocations where an increase in female bargaining power, coinciding with a simultaneous increase in household resources, results in better outcomes for girls and not boys.

JEL: O15; J12; J13; J16; J24; F22

Keywords: migration, father absence, education, gender

*I would like to thank Doug Bernheim, Luigi Pistaferri, Aprajit Mahajan, Terra McKinnish, and participants of the public economics group, as well as the labor and development reading groups at Stanford University for helpful comments. This research was supported by the Leonard W. Ely and Shirley R. Ely Graduate Student Fund through a grant to the Stanford Institute for Economic Policy Research. All errors are mine alone.

[†]Contact: francisca.antman@colorado.edu, Department of Economics, University of Colorado at Boulder, 256 UCB, Boulder, CO 80309.

1 Introduction

While the public debate over immigration in the United States still mostly focuses on families wishing to settle permanently in this country, studies show that about half of undocumented Mexican migrants to the U.S. return to Mexico within two years (Reyes, 1997). In addition, data on Mexican migrants to the U.S. reveal that a large majority of men with families in Mexico leave at least one minor child at home.¹ These facts have brought newfound attention to the consequences of these separations for the educational outcomes of the children of Mexican migrants—children who will one day become labor market participants in Mexico, and potentially the U.S. as well. This paper examines this important question by exploiting the variation in siblings' ages at the time of parental migration. I focus here on paternal migration because, as will be shown, Mexican fathers are much more likely to migrate.

Theoretically, it is unclear whether paternal migration should have a net positive or negative effect on children's education. On the one hand, the father is likely to be earning more in the U.S. than at home in Mexico, and the remittances from these earnings are likely to enable the child to devote more time to schoolwork and attain a higher level of education. However, the father's absence may impose a psychological cost on the child and may require the child to devote more time to the family or labor force to compensate for parental absence. In addition, the father's migration may teach the child about the viability of international migration as a possible career path—one in which the child's Mexican education may not be highly valued. Finally, paternal migration may change the distribution of power in

¹Author's own calculation from the Mexican Migration Project 118 (MMP118) data on household heads.

the family, so that intrahousehold allocations are largely determined by remaining family members, such as mothers, instead. If these decision makers care more about educational investments, child educational attainment may rise as a result.

Given this theoretical ambiguity, the effect of a father's migration on the educational outcomes of children in Mexico remains an empirical question. Estimation of this effect, however, is complicated by the likelihood that factors influencing parental migration also affect child educational attainment. For instance, any positive or negative selection as well as any household-level shock might have induced the parent to migrate and also may have spurred the children to drop out or remain in school.

The main empirical attempts to deal with this endogeneity problem have relied on instrumental variables (IV) for identification. Hanson and Woodruff (2003) instrument for whether a household has an external migrant with the interaction between household-level characteristics and historical migration rates at the state level. They find that 10-15 year-old children in migrant households complete significantly more schooling than their peers in non-migrant households. Using a similar identification strategy, McKenzie and Rapoport (2006) find that migration lowers schooling for 16-18 year-old boys and argue that migration may impart a disincentive effect on children in the household. As is often the case with instrumental variables methods, the exclusion restriction leaves these estimates open to criticism. For instance, historical migration rates might be indicators of the level of the development of the community and therefore the prevalence and quality of schools in the area which affect children's educational attainments directly. More importantly, if historical migration rates are proxies for networks that lower the costs of migration, then assuming children base schooling choices on future returns in the U.S. and Mexican labor markets,

they must also affect a child's educational decisions, and thus fail the requirements for IV estimation.

This paper proposes a creative solution to the endogeneity problem by relying on the variation in siblings' ages at the time of a parent's migration. Since older children in the same family are less likely to be enrolled in school and less likely to return if they drop out, their schooling outcomes are less likely to be affected by parental migration compared with those of their younger siblings. This observation is not so different from that employed by Bleakley and Chin (2004, 2010) who identify the effects of language skills on earnings and assimilation by arguing that older immigrant children are more likely to have difficulty acquiring a new language than their younger peers. In the current study, the limiting case is a child that is at least 20 years-old, because a Mexican child beyond this threshold has in all likelihood completed her education, regardless of the migration patterns of her parents.² By using a family fixed-effects regression model that permits us to hold constant effects which are common to all siblings, I can then control for all of the observed and unobserved heterogeneity at the family level that might have resulted in a non-causal correlation between the parent's migration and the child's educational outcome. Since the within-family strategy relies on differences in ages of children, I control for birth order and birth cohort effects in all specifications.

A standard critique of all fixed effects strategies is that they do not control for time-varying sources of endogeneity. However, since the fixed effects used here operate at the family level, for us to be concerned about such sources contaminating the estimates of the effect of migration on child education, there would have to be shocks that differentially affect

²I later relax that assumption to consider a 15 year-old cutoff.

a subset of children within the family and also affect paternal migration. A related pitfall of this approach is that family level fixed effects will not control for unobserved heterogeneity at the level of the individual child, so some might be concerned that parents time migration to help more able children succeed in school. However, since birth order and cohort effects are already included in the model, for this type of story to drive the results presented here, it would have to be the case that parents perceive their younger children to be increasingly more able. To my knowledge, there is no evidence that this is the case in Mexico.

A virtue of this identification strategy is that it can be easily extended to allow the impact of parental migration to vary depending on the age of the child at the time of the parental absence. Distinguishing effects based on the child's age at the time of the parent's migration also brings this paper into relation with the literature on child development and family structure which investigates the effects of father absence on children at different age groups in the context of divorce and separation. In addition, this paper makes a significant contribution to the migration literature by separating out the effects of paternal migration to the U.S. from the effects of paternal migration within Mexico, a distinction that most studies ignore. Since both domestic and international migration involve absence from the home, this distinction is even more important because it allows us to tease out the relative importance of father absence as a potential mechanism in driving the overall effect of parental migration on children's human capital investments.

Overall, this paper establishes a positive effect of paternal U.S. migration on children's educational attainments, but the results are gender-specific, suggesting that pushing a father's U.S. migration earlier in his daughter's life can lead to an increase in her educational attainment of up to 1 year relative to delaying migration until after she has turned 20. At

the same time, a father's domestic migration experience does not play a significant role in the educational outcomes of his children, suggesting that father absence is not a major factor influencing these estimates. The highly gendered results are consistent with a story in which resource-constrained families use remittances to finance their daughters' educations. Since paternal migration also coincides with a shift in household structure, it may be that women are left as the primary decision makers in the household when a father migrates and these women invest their marginal dollars in the education of girls. This interpretation is consistent with the studies on intrahousehold allocations which find that increasing bargaining power for women is associated with better outcomes for girls and not boys (see for example, Duflo, 2003 and Thomas, 1994).

The remainder of the paper is structured as follows. Section 2 considers the implications of child age at parental migration within the context of the literature on parental absence. Section 3 discusses the data used in this analysis and highlights pertinent summary statistics. Section 4 reviews the empirical strategy and regression models to be estimated. Section 5 reports the results of the estimation and discusses possible interpretations. Section 6 concludes.

2 Parental Absence and Child Development

The question of whether parental presence matters to the educational outcomes of children has long been the subject of research by social scientists studying the effects of family structure on children in the U.S.³ In the economics literature, the research has largely been

³Zoller Booth (2001) is one of a handful of papers that considers the effects of father absence on children outside of the U.S. While her study is relevant because it considers the effects of father's migration, the

focused on the aftermath of divorce and family separation, and therefore primarily surrounds the consequences of the biological father's absence from the child's home, as well as the potential income shocks that may accompany this change.

For the most part, studies on the effects of family structure on children find a negative impact of father absence on educational attainment, and differ mainly in the magnitude of their estimates and their means of identification. Grogger and Ronan (1995) exploit variation within the family in the number of years children spend in the home and find that fatherlessness reduces educational attainment for whites and Hispanics. Similarly, Sandefur and Wells (1997) find that living outside a two-parent family and changes to family structure are all detrimental to children's education. Notably, studies by Ginther and Pollak (2004) and Lang and Zargosky (2001) find that controlling for additional family background variables significantly weakens the estimated effect of family structure on children's educational outcomes. While there is comparatively little written on the case of parental absence in Mexico specifically, Giorguli Saucedo (2006) finds evidence that living with both parents delays labor force entry for Mexican children, suggesting these children have a greater opportunity to focus on schooling.

Santrock's (1972) work is especially relevant because he considers the timing of a parent's absence in the course of a child's life and the gender-specific effects of father absence. In particular, he hypothesizes that children should be more negatively affected by father absence if their fathers depart earlier in life (before age six) as opposed to later in life since older children are able to compensate for the father's absence with peer attachments. Additionally, he argues that boys should generally be more negatively influenced by father absence than

author does not consider the endogeneity of father's migration in the estimation.

girls. Thomas' (1994) review of the child development literature also suggests that paternal absence has a greater influence on boys than girls.

Of course, the permanence of family dissolution considered in the literature on father absence serves as one of the main distinctions between these studies and the case of parental migration considered here. In addition, the positive family income shock that may accompany a parent's absence due to U.S. migration will be felt simultaneously with the parental absence, potentially outweighing the negative effects of the latter. Nevertheless, the literature on father absence is an important jumping-off point for this study because it stresses the role of parental presence in the educational outcomes of children as well as the importance of considering the age of children during the parental absence.

3 Data Description

3.1 Data

The data used for this project come from the Mexican Migration Project (MMP118), a collaborative research project between Princeton University and the University of Guadalajara covering the years 1982-83 and 1987-2007.⁴ The MMP is a publicly available data set containing information on the migration patterns and a wide variety of characteristics of households in Mexico. While these households are randomly selected within community, communities are not randomly selected, so the MMP is not intended to be representative of Mexico as a whole. In its earliest period, the MMP focused mostly on rural communities in Western Mexico, an area which was a major point of origin for U.S. migrants. Since then,

⁴Available at <http://mmp.opr.princeton.edu/>.

the MMP has expanded to include a broad range of communities from rural areas as well as small cities and major metropolitan areas and now covers communities in states throughout Mexico. The communities are typically sampled in the months of December and January when temporary migrants are more likely to be home with their families in Mexico.

The MMP is of particular interest because of its rich migration and lifelong labor histories of the household head and his (her) spouse. For the purpose of investigating the importance of age of the child when the parent migrated, this is especially important because it can account for the timing of the migration trips taken by the head of household and his (her) spouse and therefore identify the ages of children when the migration was undertaken. The MMP is also quite useful in examining within-family effects because, unlike other household data sets, information on all children of the household head is provided regardless of whether they currently coreside with the parents. While the information on U.S. migration for the head of household is extensive, the MMP only has limited information on the first and last migration trips of other members of the head's family, including the children of the head, so it is not possible to track the child's migration history.

One limitation of the survey is that it only identifies the relationship between the head of household and other members of the family and household. Since the focus of this paper is on children of migrants, I restrict the sample to children of the heads of household. By far, most of the heads of household are men (around 80 percent), so most of the children are observed in the household of their father. For purposes of documenting both parents' migration experiences, I make the assumption that the spouse of the head of the household, if present, is also the parent of the children. This will mostly affect whether mothers are correctly identified, and, as will be shown below, the extent of mother's migration is very

limited in any case.

Another limitation of the survey is that it does not collect comprehensive information on the timing of domestic migration. However, if parents with no U.S. migration experience have migrated domestically, including them with the sample of parents who have never left their children may lead to biased results. Since the MMP only collects information on first and last domestic migration, I use the lifelong labor histories of the head and spouse to construct a domestic migration history based on whether the individual changed jobs into another state within Mexico. Separating out the effects of domestic migration from U.S. migration marks another important contribution of this paper over other studies of Mexican migration in which only international migration is examined and in which domestic migrants are often treated similarly to those with no absence from the home.

Finally, any discussion of the effects of parental migration must consider the possibilities of a child migrating along with the parent. To be sure, potentially the most pivotal way that parental migration can affect a child's education is if the child migrates as well, thus confounding the effect of parental migration with the child's own migration experience. As the MMP does not contain comprehensive migration histories for children, I address this problem by excluding children whose first migration trip was before the age of 20, the period of childhood considered in this paper. This includes approximately 20 percent of the original child sample, leaving me with 34,706 adult children who are at least 20 years-old and whose households are interviewed in Mexico. Twenty years of age is taken as the threshold after which a parent's migration no longer has any effect on a child's education because, as the descriptive statistics will attest to below, by that age, it is expected that a Mexican child will have completed his education. In the robustness section below, I lower the threshold

to 15 years of age.

3.2 Descriptive statistics

The sample of children who are at least 20 years-old at the time of the survey with no domestic or migration experience prior to age 20 amounts to 34,706 individual child observations from 9,006 families. Table 1 describes the overall sample. The average age of children in the sample is about 32 years-old and the average level of educational attainment is about 8 years (median of 6 years). Almost 90 percent of the sample report fewer than 14 years of completed schooling, justifying the assumption that most children are in fact finished with their educations by 20 years of age. I divide the child's life into six periods when the parent may have migrated: before the child was born, when the child was 0-4 years-old, when the child was 5-9 years-old, when the child was 10-14 years-old, when the child was 15-19 years-old, and when the child was at least 20 years-old. The average number of periods when either the mother or father was absent is about 1.1. For this reason, this paper will focus on the effect of the parent's first migration trip.⁵

3.2.1 Extent of migration in the sample

On the issue of parental migration, about 27 percent of children have fathers that migrated to the U.S. at some point, while around 3 percent have mothers that have done the same. About 18 percent have fathers who have migrated domestically, and about 6 percent have mothers

⁵Attempting to separate out the effect of parental migration from the effect of the parent's first migration yields qualitatively similar results to those presented here. Results from the more extended model are available on request.

who have migrated within Mexico. Conditional on having a father with U.S. migration experience, on average, the first trip began about two years before the birth of the child, while the first domestic migration experience was around one year before the child's birth. In contrast, those children with mothers who migrated within Mexico were on average about 2 years-old at the time of the mother's first domestic migration while children with mothers who migrated to the U.S. were on average about 15 years-old. This pattern of statistics confirms that it is mainly fathers in the households that have migration experience, and justifies this paper's focus on paternal migration.⁶ While paternal migration to the U.S. is more prominent than within Mexico, there is also a substantial fraction of fathers that have migrated within Mexico. As mentioned above, this sample is restricted to children with no migration experience before the age of 20. Of these children, it is interesting to note that their subsequent migration patterns also occur early in life. The average age at a child's first U.S. migration is 26 while the average age at the child's first domestic migration is just slightly below that.

3.2.2 Migration and remittances

One of the most important factors distinguishing the effects of international versus domestic migration on education is the difference in remittances. A priori, I would expect the remittances to be much larger coming from the U.S. as the wage is much higher in the U.S. than in Mexico. While the MMP does not have information about remittances from domestic migration spells, it does have information about earnings during the last reported domestic

⁶Full results with mother's migration in the analysis yield similar results for the effects of paternal migration on child educational attainment and are available from the author upon request.

migration. I compare these domestic migration earnings with earnings during the last U.S. migration and earnings while at home in Table 2. Unfortunately, there is no information on time spent working in Mexico, so I base my estimate of daily earnings on an 8-hour workday, 40 hour-work week, and 50 weeks worked per year for those respondents who quote earnings in anything other than a daily rate. The last domestic wage and the home wage are very similar, with the former being around \$17 (2002 U.S. dollars) a day and the latter being around \$19. Thus it appears that there is not a substantial difference between earnings while at home and earnings elsewhere in Mexico, suggesting that if there is an effect of domestic parental migration on child outcomes, it will operate mainly through parental absence.

In contrast, the U.S. daily wage is estimated to be about \$85 using the 8-hour per day conventions, and about \$60 using the data reported on hours worked per week in the U.S. The reported level of U.S. remittances is about \$281 per month, or about 3-5 times the estimated daily wage. While there is substantial variation in both U.S. and Mexican wages, these data support the hypothesis that the financial benefits of U.S. migration are likely to be much greater than those from Mexican migration.

3.2.3 Variation in child age at the time of parental migration

Table 3 shows the distribution of children with parental migration experience across the six groups based on child age at time of parent's migration. The bottom row sums over the previous entries in the respective column and thus displays the total number of children who experience paternal U.S. and paternal domestic migration at some point in their lives. Since I have excluded those children with no migration experience before age 20, it is only possible that these children accompanied their parents after they were already adults, and

thus when it was unlikely to have any further impact on their educational outcomes. Most notably, a majority of parents who migrate at some point do so before the birth of a child. Nevertheless, it is also noteworthy that there is significant variation in child age at the time of parental migration beyond birth, with about a third of the sample experiencing paternal migration between birth and 20 years of age. A much smaller fraction of fathers migrate for the first time after a child has turned 20, a fact that will certainly have an impact on the precision of some of the estimates below. It also calls into question whether the sample of parents who migrate after their children are twenty are representative of the population at large. For this reason, I relax this threshold in the robustness section below to consider a control group where it is assumed that parents who migrate after a child has turned 15 have no impact on the educational outcomes of their children.

Since the variation in ages of siblings at the time of their parent's migration is critical for this analysis, it is important to establish the extent of this variation in the sample before turning to the fixed-effects estimation. Table 4 gives a sense of the number of families on which identification relies. As documented in panel A, of the 238 families with at least one child 20 and older at the time of the parent's first migration, 136 also had at least one child who was below the cut-off. These families have close to 8 children on average, and the children below 20 will thus be members of the treatment group for whom parental migration affects educational attainment. Panel B gives a more detailed sense of the variation which underlies identification of the effects of child age at departure by grouping children into 5 year age categories based on their ages at the time of the father's migration. Of the total 2,427 families in which fathers have some U.S. migration experience, 597 families have children in two, not necessarily adjoining, age groups at the time of the father's first U.S. migration,

while 241 families have children in 3 age groups at the time of the father’s first U.S. trip.

4 Empirical Strategy

4.1 Overall effect of parental migration on schooling

As mentioned above, the empirical strategy I use to identify the effect of parental migration on education relies on the assumption that having a parent migrate for the first time when the child is beyond the age of 19 is akin to never having had a parent migrate at all. Thus, using family fixed-effects estimation allows me to compare such a child to his siblings who were at a more formative age when the parent undertook migration, and whose schooling patterns were consequently affected by the experience of parental migration. This amounts to estimating the following regression model:

$$edu_{if} = dad_mig_US_{if}\beta_1 + dad_mig_DOM_{if}\beta_2 + X_{if}\gamma + u_f + v_{if}, \quad (1)$$

where edu_{if} is the number of years of schooling of child i in family f , $dad_mig_US_{if}$ is a dummy variable equal to one if the father migrated to the U.S. before the child was 20 and zero otherwise and $dad_mig_DOM_{if}$ is equal to one if the father migrated within Mexico before the child was 20 and zero otherwise. X_{if} is a vector of control variables consisting of a dummy variable equal to one if the child is female (in the specifications that are not run separately by gender), a linear birth order variable, a dummy indicator for the oldest child, a dummy variable equal to one if the child is the youngest of the siblings, and a vector of

dummy variables indicating into which 10-year birth cohort the child was born. The birth cohort dummies address the concern that the difference in ages between siblings is picking up the overall increases in educational attainment Mexico experienced over the course of the last century. The family fixed effect, u_f , captures any observed or unobserved heterogeneity common to the siblings in family f , including characteristics of the parents and community of origin, and v_{if} is assumed to be an i.i.d. disturbance term with zero mean.

Ideally, this identification strategy would be able to not only establish whether the effects of parental migration on child education are positive or negative, but also illuminate the causal mechanisms at play. Controlling for Mexican domestic migration in the above specification is one attempt to inform that debate, since both migrant fathers in the U.S. and migrant fathers in Mexico will be absent from the home. Thus, the difference between the U.S. migration and domestic migration coefficients, should capture effects that are specific to international migration.

4.2 Education and child age during parental migration

This paper also contributes the literature on the impact of parental absence on child outcomes by discussing the effect of parental migration on child educational attainment based on the age of the child during the parent’s absence. The regression model can be described as:

$$edu_{if} = \sum_{j=0}^4 dad's_mig_US_{ifj}\beta_{1j} + \sum_{j=0}^4 dad's_mig_DOM_{ifj}\beta_{2j} + X_{if}\gamma + u_f + v_{if}. \quad (2)$$

The variables describing the timing of the father’s first migration trips are contained in $dad's_1st_mig_US_{ifj}$ and $dad's_1st_mig_DOM_{ifj}$. For example, $dad's_1st_mig_US_{ifj}$

is a dummy variable indicating whether the father made his first migration trip to the U.S. in one of the following j periods: before the child was born, when the child was between 0 and 4 years of age, when the child was between 5 and 9 years-old, when the child was between 10 and 14, when the child was between 15 and 19, and with the base group including those children whose fathers migrated sometime after they had turned 20. The remaining variables are as stated in the previous section.⁷

I estimate equations (1) and (2) allowing for the family fixed effect to capture all observable and unobservable heterogeneity at the family level. This could include any family-level characteristics and shocks that affect both parental migration patterns and children's education. Since u_f is likely to be correlated with the father's migration pattern, controlling for it presents a significant step forward in estimating the effects of parental migration patterns on education. The identifying assumption is that after including the family fixed effect, there is no correlation between the remaining error term and the factors predicting parental migration. As noted above, this strategy will not control for time-varying sources of endogeneity. However, since the fixed effects used here are at the family level, any endogenous shocks would have to be correlated with paternal migration while at the same time affecting some children within the family and not others. Since birth order and cohort effects are already controlled for in the model, I find this unlikely to be the case.

⁷An alternative model would include dummies for parental migration experience in addition to the dummies describing when the parent first began migrating. The results of such a specification are similar to those presented below.

5 Results

5.1 Overall effect of parental migration

I begin by estimating equation 1 to determine the effect of parental migration on child education by grouping children into categories based on whether their parents migrated before or after the child was beyond the age at which a parent's migration could have had an impact on the child's education, taken here to be 20 years of age. As shown in column (1) of Table 5, a father's migration to the U.S. before the child reaches this critical age is associated with an increase in educational attainment of 0.29 years of schooling, but the point estimate is not statistically significant. Interestingly, a father's migration within Mexico is associated with almost no difference in educational attainment relative to fathers with no migration experience. The point estimate of -0.05 is also not statistically significant.

As is common in the literature on parental absence and intrahousehold allocations, one might argue that boys' and girls' educational outcomes are determined differently even within families, and should thus be estimated separately. Columns (2) and (3) of Table 5 show the results of estimating equation 1 separately for boys and girls, respectively. While the effects of parental migration are again not statistically significant for boys, they are closer in magnitude, with the point estimate for a father's U.S. migration around 0.23 and the point estimate for a father's Mexican migration around 0.26. For girls, however, having a father migrate to the U.S. is associated with an increase of almost 0.71 years of schooling, a result which is significant at the 5 percent level. In contrast, having a father migrate within Mexico is associated with almost no increase in schooling for girls (point estimate of 0.08) and is not statistically significant. Thus, it seems that the main beneficiaries of

paternal U.S. migration are girls. It could also be argued that since domestic migration is not significantly affecting educational outcomes relative to staying at home, paternal absence alone is not conferring a significantly detrimental effect on girls.

5.2 Effects by child age

Table 6 shows the results from estimating the family fixed-effects regression in equation 2. Column (1) shows that the effects of the individual control variables on educational attainment are as expected. There is a statistically significant negative effect of being female, a positive effect of being the oldest child, and a somewhat smaller, though positive effect of birth order on years of schooling, indicating that younger siblings in the family have higher levels of educational attainment. Having a father migrate to the U.S. before the child is born results in an increase of 0.65 years of education. While the latter result is significant at the 5 percent level, the coefficients on the remaining age groups are not statistically significant and have smaller point estimates.

Looking at the results of the gender-specific estimation, we see the same pattern of boys not reflecting statistically significant gains from a father's U.S. migration, while the main benefits are conferred on girls. A father's first U.S. migration before the birth of a girl raises educational attainment by almost a full year (point estimate of 0.99) and is significant at the 5% level. The remaining point estimates on a father's first U.S. migration are 1.04 for 0-4 year-old girls, 0.99 for 5-9 year-old girls, and subsequently drop to 0.66 for 10-14 year-old girls, and 0.61 for 15-19 year-old girls, although none of the differences in point estimates are statistically significant. The fact that the point estimates are very close in magnitude

for the first three age groups again suggests that, at least for young girls, the absence of a father does not mitigate the positive effect of migration.

5.3 Robustness

As mentioned in the Data section, one concern with the data used here is that full domestic migration histories are not available for the head and his spouse and are thus constructed from labor histories that document changes in jobs across state boundaries. Surely, there are some domestic migrations that are not captured by this categorization. In addition, this method may leave us with a base group of individuals who are less mobile by definition as they have never moved out of state after entering the labor force. To address the potential bias this approximation may cause, I return to the standard method in the literature of comparing children whose parents have had some U.S. migration experience with those children whose parents have had no U.S. migration experience but may have migrated domestically or not at all. While this reverts to the muddling of the base group which the above method was intended to resolve, one can also view a comparison of this exercise and the one above as a measure of the likely success of other studies that are unable to differentiate domestic migrants from those parents who have never separated from their children.

The results of estimating the effect of parental U.S. migration with no distinction for domestic migrants can be found in Table 7. Compared with the results from Table 5, we see that the point estimates are very similar, again with the only statistically significant effect of paternal U.S. migration flowing to girls, who raise their schooling by about 0.71 years in response. The analogue of Table 6 with the conflated base group of non-U.S.-migrants can be

found in Table 8. The point estimates are again very similar to the results when controlling for domestic migration, with the effect of a father's first U.S. migration increasing child education by 0.63 years in the overall sample and 1.01 in the sample of girls. This suggests that however faulty the construction of domestic migration variables may have been, their inclusion does not significantly alter the estimates from what would have prevailed using the approach of combining domestic migrants with non-migrants. To the extent that paternal domestic migration was simply capturing the effect of father absence, this exercise thus adds to the perception that father absence is not a significant determinant in child educational attainment.

Table 9 shows the results from another important robustness check to confirm that the results are not purely coming from the arbitrary cut-off of 20 years of age. As some might argue, in a country like Mexico, fifteen would be a more appropriate threshold for the assumed age beyond which parental migration should no longer affect child education. Certainly, the fact that some children beyond the 15 year-old threshold are still getting their educations, either because they had to repeat grades or they went above and beyond the average years of schooling, means that there may be some "contamination" of the control group in this exercise. Although the magnitude of the coefficient estimates drop and are no longer statistically significant, we see that the point estimates of the effect of parental migration on education show the same pattern and are again highest for girls despite this change.

5.4 Discussion

Two points emerge from the results presented here: (1) parental domestic migration does not seem to have a significant impact on the educational attainment of children and (2) parental U.S. migration matters for the educational attainment of girls and not boys. Both parental migration to the U.S. and domestic migration to another state within Mexico involve father absence. Yet, there is no statistically significant difference between the educational outcomes of siblings who experienced parental domestic migration and those who did not. This suggests that father absence, at least for children of migrants, is not playing a major role in their educational outcomes. The similarity of the point estimates for the effects of paternal migration on girls before birth versus after birth is also supportive of this hypothesis. The fact that the point estimates for the effect of U.S. migration on child's educational attainment are similar whether or not we control for parental domestic migration also lends credence to this interpretation.

After addressing selection into migration, what then is the main difference between migrating domestically and internationally? Potentially, children whose parents migrate to the U.S. might also learn about the returns to international migration, but if this effect were strong, we would expect to see it operating mainly on the educational investments of boys because men are more likely to migrate. Instead, boys show no statistically significant response to paternal migration. Summary evidence from Section 2 suggests that the main difference between international and domestic migration is the importance of remittances, as there is no significant wage premium to migrating out of state but there is a large premium to migrating to the U.S.

But why should these remittances affect educational investments in girls and not boys? Having already ruled out the likelihood that father absence is playing a significant role in the results, one possibility is that families are resource-constrained and when that constraint is relaxed by the father's migration abroad, these marginal dollars are used to invest in educating girls. The fact that girls in this sample have lower years of schooling than boys (median of 6 versus 8 years) is supportive of this interpretation. Since the mother is likely to remain at home with her children while the father is away, paternal U.S. migration likely marks both an increase in remittances and a shift in decision-making power toward the parent that remains in the household, namely the wife and mother. Thus, this finding can also be interpreted as further evidence that increasing bargaining power for women, coinciding with a simultaneous increase in resources, improves outcomes for girls and not boys, as has been found elsewhere in the literature on intrahousehold allocations. However, having no information on preferences within the household, I cannot rule out that fathers determine the redirection of household resources toward girls from abroad.⁸

6 Conclusion

By using a family fixed-effects regression model to get around the endogeneity of parental migration, this paper has established a positive link between paternal U.S. migration and children's educational attainment, but only for daughters of migrants. Specifically, the evidence suggests that pushing father's U.S. migration earlier in a daughter's life, even

⁸See Yang, et al. (2009) for a discussion of the problem faced by international migrants in exerting control over the channeling of remittances.

before she is born, would lead to an increase in educational attainment by as much as one year relative to delaying migration until after she has turned 20. Under the assumption that children whose parents migrate after the child has turned 20 are akin to having a parent who never migrated, the within-family approach yields estimates that having a migrant father increases educational attainment by about 0.7 years for girls, with no significant effect for boys. At the same time, controlling for parental domestic migration does not seem to have any effect on educational attainment, nor does it affect the estimates of paternal U.S. migration, suggesting that father absence is not a major mechanism underlying the effects of paternal migration on educational attainment.

These findings are consistent with a story in which U.S. migration relaxes credit constraints, enabling families to invest in the educations of their daughters in Mexico. Since the results are overwhelmingly gender-specific, they are also supportive of the findings from the literature on intrahousehold allocations which suggest that increasing women's decision-making power, while also increasing the resources available to them, results in better outcomes for girls and not boys. Further research should examine the relative importance of migrant fathers' preferences in the determination of intrahousehold allocations while they are away.

References

- Antman, Francisca M. 2007. "Migration and the Mexican Family: Exploring the Consequences for Those Left Behind." Ph.D. diss. Stanford University. ProQuest: AAT 3267454.
- Ashraf, Nava, Diego Aycinena, Claudia Martinez and Dean Yang. 2009. "Remittances and the Problem of Control: A Field Experiment Among Migrants from El Salvador." Unpublished manuscript.
- Bleakley, Hoyt and Aimee Chin. 2004. "Language Skills and Earnings: Evidence from Childhood Immigrants." *The Review of Economics and Statistics*, 86(2): 481-496.
- Bleakley, Hoyt and Aimee Chin. 2010. "Age at Arrival, English Proficiency, and Social Assimilation Among US Immigrants." *American Economic Journal: Applied Economics*, 2(1): 165-192.
- Duflo, Esther. 2003. "Grandmothers and Granddaughters: Old-Age Pensions and Intra-household Allocation in South Africa." *The World Bank Economic Review* 17(1): 1-25.
- Ginther, Donna K. and Robert A. Pollak. 2004. "Family Structure and Children's Educational Outcomes: Blended Families, Stylized Facts, and Descriptive Regressions," *Demography*, 41(4): 671-696.
- Giorguli Saucedo, Silvia E. 2006. "School Dropout Rates, Adolescent Labor and Family Structures in Mexico." In *Population, City and Environment in Contemporary Mexico*, ed. José Luis Lezama and José B. Morleos, 223-257. México, D.F.: El Colegio de México.
- Grogger, Jeff and Nick Ronan. 1996. "The Intergenerational Effects of Fatherlessness on Educational Attainment and Entry-Level Wages." National Longitudinal Surveys Discussion Paper, Bureau of Labor Statistics.

Hanson, Gordon H. and Christopher Woodruff. 2003. "Emigration and Educational Attainment in Mexico." Mimeo. University of California, San Diego.

Lamb, Michael E. and Catherine S. Tamis-LeMonda. 2004. "The Role of the Father: An Introduction" in *The Role of the Father in Child Development*, ed. Michael E. Lamb. Hoboken, N.J.: John Wiley & Sons, Inc.

Lang, Kevin and Jay L. Zagorsky. 2001. "Does Growing Up with a Parent Absent Really Hurt?" *The Journal of Human Resources*, 36(2): 253-273.

McKenzie, David and Hillel Rapoport. 2006. "Can Migration Reduce Educational Attainments? Evidence from Mexico." World Bank Policy Research Working Paper No. 3952.

McKenzie, David and Hillel Rapoport. 2007. "Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico." *Journal of Development Economics*, 84(1): 1-24.

Mexican Migration Project MMP118, <http://www.mmp.opr.princeton.edu>.

"The Mexican Migration Project Weights" <http://lamp.opr.princeton.edu/documents-weights-en.aspx>

Reyes, Belinda I. 1997. "Dynamics of Immigration: Return to Western Mexico," Public Policy Institute of California.

Sandefur, Gary D. and Thomas Wells. 1997. "Using Siblings to Investigate the Effects of Family Structure on Educational Attainment." Institute for Research on Poverty Discussion Paper no. 1144-97.

Santrock, John W. 1972. "Relation of Type and Onset of Father Absence to Cognitive Development." *Child Development*, 43(2): 455-469.

Thomas, Duncan. 1994. "Like Father, Like Son; Like Mother, Like Daughter: Parental Resources and Child Height." *The Journal of Human Resources*, 29(4): 950-988.

Winship, Christopher and Larry Radbill. 1994. "Sampling Weights and Regression Analysis." *Sociological Methods and Research*, 23(2): 230-257.

Zoller Booth, Margaret. 1995. "Children of Migrant Fathers: The Effects of Father Absence on Swazi Children's Preparedness for School." *Comparative Education Review*, 39(2): p.195-210.

Table 1: Descriptive Statistics of Child Sample

	Mean	Std. Dev.	N
Age	32.26	9.43	34706
Female	0.53	0.50	34706
Completed Education (Years)	7.95	4.28	34706
Sibship Size	7.47	3.05	34706
No. of Periods in Child's Life When Mom or Dad is Absent	1.09	1.61	34706
<u>Child's Parental Migration Experience</u>			
Father Migrated to US at Some Point	0.27	0.45	34706
Father Migrated in MX at Some Point	0.18	0.38	34706
Mother Migrated to US at Some Point	0.03	0.18	34706
Mother Migrated in MX at Some Point	0.06	0.23	34706
Age at Father's First US Departure ¹	-2.35	12.86	9446
Age at Father's First Domestic Departure ¹	-1.25	13.17	6137
Age at Mother's First US Departure ¹	14.66	16.82	1180
Age at Mother's First Domestic Departure ¹	1.78	13.82	1948
Age at Child's First US Migration	26.05	6.37	5901
Age at Child's First Domestic Migration	25.77	5.83	3338

¹This refers to the age of the child as constructed by the author. Note that this is allowed to be negative in order to reflect migration before the birth of the child.

Table 2: Comparison of U.S. and Mexican Migrant Wages (Male Household Heads)

	Mean	Std. Dev.	25%	75%	N
Daily Earnings During Last Domestic Migration	17.21	422.15	0.01	10.95	2837
Daily Earnings During Last Mexican Job (1)	19.00	27.89	8.25	21.16	4602
Daily Earnings During Last US Migration (2)	85.45	2167.66	24.38	58.03	3503
Daily Earnings During Last US Migration (3)	60.15	174.99	25.40	69.19	3756
Average Monthly Remittances During Last US Migration	280.69	512.90	26.42	364.17	4607
Hourly Wage	6.55	16.21	3.10	7.25	3814
Usual Hours Worked Per Week	46.38	15.17	40	54	4906
Months Worked Per Year	7.39	3.79	4	12	5066

Notes:

All values in 2002 US dollars

(1) Only for communities 53-118

(2) Based on 40 hours per week, 50 wks/yr

(3) Based on US hours data, 5 days per week

Table 3: How Many Children Experience Paternal Migration?

Distinguished by child's age during father's absence

How many children first experienced paternal migration during the specified period?

	Dad's 1st US trip		Dad's 1st MX trip	
	Observations	Percent	Observations	Percent
Before Child's Birth	5682	60.15%	3629	59.13%
Child 0-4 Years-old	1255	13.29%	764	12.45%
Child 5-9 Years-old	853	9.03%	527	8.59%
Child 10-14 Years-old	595	6.30%	392	6.39%
Child 15-19 Years-old	431	4.56%	297	4.84%
<u>Child At Least 20 Years-old</u>	<u>630</u>	<u>6.67%</u>	<u>528</u>	<u>8.60%</u>
Total	9446	100.00%	6137	100.00%

Table 4: Variation in Child Age at Father's 1st US Departure

Panel A: How many families have children above and below the 20 year-old cutoff?

Families with at least one child 20+ when father first migrated to US	238
Those with at least one child under 20	136
Those with no children under 20	102

Panel B: How much within-family variation is there in age at father's 1st US migration?

Number of age groups ¹ children fall into	Number of families
1	1499
2	597
3	241
4	68
5	19
6	3
Families with fathers who have some US migration experience	2427

¹Children within the family are grouped into the following age categories based on their ages at the time of the father's first U.S. migration: Before birth, 0-4, 5-9, 10-14, 15-19,

Table 5: The Effect of Parental Migration on Child Education

Assuming children who experience paternal migration before age 20 make up the treatment group

	(1)	(2)	(3)
	Boys & Girls	Boys	Girls
	Education (Yrs)	Education (Yrs)	Education (Yrs)
Father Migrated to US Before Child Was 20	0.287 [0.209]	0.226 [0.380]	0.705 [0.292]**
Father Migrated Within MX Before Child Was 20	-0.048 [0.244]	0.256 [0.504]	0.075 [0.353]
Birth Order	0.185 [0.013]***	0.154 [0.023]***	0.193 [0.020]***
Oldest	0.388 [0.044]***	0.435 [0.082]***	0.277 [0.068]***
Youngest	0.04 [0.059]	-0.084 [0.110]	0.091 [0.090]
Female	-0.227 [0.033]***		
Family Fixed Effects	YES	YES	YES
10-Year Birth Cohort Dummies	YES	YES	YES
Observations	34706	16427	18279
Number of families	9006	7170	7533

Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: The Effect of Child Age During Parental Migration on Educational Attainment

	(1)	(2)	(3)
	Boys & Girls	Boys	Girls
	Education (Yrs)	Education (Yrs)	Education (Yrs)
<u>When was Dad's 1st US trip?</u>			
Before Child Born	0.646 [0.301]**	0.772 [0.549]	0.987 [0.428]**
Child 0-4 Years-old	0.364 [0.287]	0.008 [0.521]	1.042 [0.405]**
Child 5-9 Years-old	0.216 [0.266]	-0.219 [0.485]	0.986 [0.386]**
Child 10-14 Years-old	0.381 [0.246]	0.428 [0.440]	0.664 [0.364]*
Child 15-19 Years-old	0.289 [0.216]	0.277 [0.401]	0.609 [0.287]**
<u>When was Dad's 1st domestic migration?</u>			
Before Child Born	-0.173 [0.353]	0.145 [0.661]	0.369 [0.536]
Child 0-4 Years-old	0.074 [0.345]	0.268 [0.655]	0.629 [0.512]
Child 5-9 Years-old	0.114 [0.319]	0.389 [0.621]	0.566 [0.478]
Child 10-14 Years-old	-0.047 [0.307]	0.135 [0.622]	0.181 [0.450]
Child 15-19 Years-old	-0.108 [0.257]	0.232 [0.525]	-0.087 [0.371]
Birth order	0.182 [0.013]***	0.147 [0.023]***	0.192 [0.020]***
Oldest	0.391 [0.044]***	0.439 [0.082]***	0.276 [0.068]***
Youngest	0.042 [0.059]	-0.081 [0.109]	0.095 [0.090]
Female	-0.226 [0.033]***		
Family Fixed Effects	YES	YES	YES
10-Year Birth Cohort D	YES	YES	YES
Observations	34706	16427	18279
Number of families	9006	7170	7533

Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: The Effect of Parental Migration on Child Education with Combined Base Group
 Base group includes children whose parents had domestic migration experience and those whose parents had no migration experience

	(1)	(2)	(3)
	Boys & Girls	Boys	Girls
	Education (Yrs)	Education (Yrs)	Education (Yrs)
Father Migrated to US Before Child Was 20	0.286 [0.209]	0.226 [0.380]	0.709 [0.294]**
Birth Order	0.184 [0.013]***	0.155 [0.023]***	0.193 [0.020]***
Oldest	0.389 [0.043]***	0.434 [0.082]***	0.276 [0.067]***
Youngest	0.04 [0.059]	-0.083 [0.110]	0.091 [0.090]
Female	-0.227 [0.033]***		
Family Fixed Effects	YES	YES	YES
10-Year Birth Cohort Dummies	YES	YES	YES
Observations	34706	16427	18279
Number of families	9006	7170	7533

Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: The Effect of Child Age During Parental Migration on Educational Attainment Revisited

Base group includes children whose parents had domestic migration experience and those whose parents had no migration experience

	(1)	(2)	(3)
	Boys & Girls	Boys	Girls
	Education (Yrs)	Education (Yrs)	Education (Yrs)
<u>When was Dad's 1st US trip?</u>			
Before Child Born	0.631 [0.300]**	0.768 [0.548]	1.006 [0.430]**
Child 0-4 Years-old	0.349 [0.287]	0.002 [0.522]	1.051 [0.407]***
Child 5-9 Years-old	0.209 [0.266]	-0.221 [0.485]	1.002 [0.388]***
Child 10-14 Years-old	0.374 [0.246]	0.428 [0.440]	0.672 [0.365]*
Child 15-19 Years-old	0.289 [0.216]	0.28 [0.401]	0.621 [0.288]**
Birth order	0.18 [0.013]***	0.146 [0.023]***	0.192 [0.020]***
Oldest	0.393 [0.044]***	0.439 [0.082]***	0.278 [0.067]***
Youngest	0.043 [0.059]	-0.08 [0.109]	0.093 [0.090]
Female	-0.227 [0.033]***		
Family Fixed Effects	YES	YES	YES
10-Year Birth Cohort Dummies	YES	YES	YES
Observations	34706	16427	18279
Number of families	9006	7170	7533

Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: The Effect of Parental Migration on Education; 15 Year-old Cutoff

Assuming children who experience paternal migration before age 15 make up the treatment group
 Base group includes children whose parents had domestic migration experience and those whose
 parents had no migration experience

	(1)	(2)	(3)
	Boys & Girls	Boys	Girls
	Education (Yrs)	Education (Yrs)	Education (Yrs)
Father Migrated to US Before Child Was 15	0.11	0.029	0.375
	[0.169]	[0.324]	[0.255]
Birth Order	0.185	0.155	0.194
	[0.013]***	[0.023]***	[0.020]***
Oldest	0.388	0.433	0.275
	[0.043]***	[0.082]***	[0.067]***
Youngest	0.04	-0.084	0.093
	[0.059]	[0.110]	[0.090]
Female	-0.227		
	[0.033]***		
Family Fixed Effects	YES	YES	YES
10-Year Birth Cohort Dummies	YES	YES	YES
Observations	34706	16427	18279
Number of families	9006	7170	7533

Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%