Mother's Autonomy and Child Welfare - A New Measure and Some New Evidence

Tanika Chakraborty
German Institute of Economic Research (DIW Berlin), and IZA, Bonn

Prabal K. De
The City College of New York, NY

Abstract

We construct a new, direct measure of female autonomy in household decision-making by creating an index from the principal components of a variety of household decision variables. We find that greater autonomy for mothers leads to better secondary education for boys, but not girls. For identification, we argue that given the migration pattern and motivation in Mexico, relative geographic proximity of spousal parents can serve as instruments for relative autonomy to ameliorate the potential endogeneity between autonomy and child outcomes. While our findings support rejection of income-pooling within family, they caution against the success of gender-directed conditional cash transfer programs.

Keywords: Female Empowerment, Principal Component, Education, Instrumental Variable
JEL Codes: D1, I28, J10

1 Introduction

Economists and policymakers have sought to answer the question whether more economic or political power in the hands of a female member in the family has the same welfare effects as equivalent power in the hands of a male member.[1] In the context of both developed and developing countries, it has been found that the effect of a dollar that is earned by a female member of a family is different from those of a dollar earned by a male member. Except for a few recent studies, evidence overwhelmingly fails to reject the conjecture that incomes accruing to female members of the household are beneficial to the family members, particularly children, in the conventional economic sense - greater female autonomy leads to a reduction in fertility, a rise in birth-weight, and an increase in survival rates.[2] Several countries have implemented policies that are geared towards greater transfer of income towards women.[3]

However, unless we have a measure of female autonomy, we do not know the effectiveness of this line of policy-making. In other words, unless we know that a dollar earned by a female member is spent by her on her own volition and not as directed by other male members, notably her husband, the efficacy of gender-sensitive policies will be confounded. For example, there is some evidence that the female oriented conditional cash transfer program in Mexico, Opportuidades (formerly known as Progresa) has led to increases in aggressive behavior and violent threats from the recipients husbands as increasing income for their spouses has hurt their ego (Angelucci et. al., 2009; Bobonis et al., 2009).

We attempt to fill this gap in two ways. We first create a direct measure of female autonomy

[1] Female autonomy has been researched in various contexts. Some notable being (1) autonomy in household decision (Anderson and Eswaran, 2009, Kantor 2003), (2) autonomy in political participation in developing countries(Chattopadhyay and Duflo, 2004) and (3)autonomy in contraceptive use and labor market participation in the United States (Goldin and Katz 2000, Oreffice 2007)

[2] See Kantor (2003) and Rahman and Rao (2004)

[3] These range from micro-credit lending, to reservation in the legislature to conditional cash payments.

exploiting the rich nature of Mexican Family Life Survey Data and then we examine the effects of such autonomy for mothers on their secondary school-going children. Our autonomy measure is based on household member responses and not inferential. We also try to establish a causal link between mothers autonomy and her childs education.

Identification of female autonomy empirically is challenging, because the decision making process among family members, particularly the spouses, remains unobservable to the researchers. To resolve this problem, researchers have used transitory income or conditional cash transfer programs as proxies for female autonomy in reduced form estimations or have conducted randomized experiments to estimate the effects of a change in relative income on the intra-household distribution of resources.[4] Anderson and Eswaran (2009) address this issue to some extent and find that income earned outside family farm generates greater autonomy. Some papers that do use a direct measure of female autonomy are Reggio (2010), Jensesn and Oster (2009) and Pitt, Khandker, Cartwright (2006). While the latter two use an index of Mother's Autonomy as an outcome variable, Reggio looks at the effect of Mother's Autonomy on child labor. However, she uses a structural estimation framework in contrast to our approach of an Instrumental Variable strategy to deal with the potential endogeneity of mother's autonomy. To summarize, majority of these studies tend only to reject the unitary model of intra-household resource allocation, as propounded by Becker (1991), without uncovering the intra-household decision making process. Relative income, whether transitory or permanent, is only one of the many variables that may potentially affect power sharing within the household (Chaippori et. al. 2002). Spouses negotiate decision-making on a large number of variables.

[4]Thomas (1990) was one of the first to point out that income effects across gender may be different. There is a vast literature that followed - Lundberg et. al (1997), Hotchkiss (2005), Ward-Batts (2008) and Brown (2009) to name a few. Ashraf(2009) conducted a field experiment in Philippines where private and public behaviors of spouses were tracked to elicit differential spousal behavior. A related literature, Folbre 1984 and Lee 2007, explicitly deals with women's bargaining power within the family. Unfortunately, a full evaluation of this literature is beyond the scope of our paper.

We have tried to open the blackbox of female autonomy and look into the underlying dynamics between spouses, creating an autonomy index that is replicable in other settings. We also show that higher female autonomy does not necessarily mean better outcomes for children, particularly girls at secondary school-going age. We create the female autonomy index using a unique survey design that collects information on each spouse's perspective on domestic decision-making on a set of variables. Mexican Family Life Survey (henceforth, MxFLS) interviews each adult in the family such that the husband independently gives his opinion about who takes the decision-himself, his spouse or both (likewise for his wife). The setting is ideal to measure female autonomy "defined as the ability of women to make choices/decisions within the household relative to their husbands"(Anderson and Eswaran, 2009). Since working with twelve variables can be cumbersome and confusing, we have reduced the dimensionality of the decision matrix by taking the principal component of the same and creating an index for female autonomy. This approach has several other advantages. First, it is a continuous, time-variant measure that gives a range of autonomy. Second, it takes on the issue of decision-making directly, instead of inferring from indirect proxy measures such as access to transitory or transfer income. Third, with more and more surveys asking such questions, this measure is easily replicable.[5]

We use our autonomy index to examine the effects of female autonomy on children's education, particularly enrollment and retention at the secondary school level. Mexico is at a stage of development where, except for some remote rural areas, primary schooling has been almost universal. Primary enrollment is likely to be invariant to the parental characteristics. However, secondary enrollment and completion have lagged much behind primary enrollment and completion and students have a tendency to drop out of secondary school (Angelucci et al.,2010). Therefore, mother's

[5]For example, Demographic Health Survey has been asking these questions for all its rounds. However, DHS asks these decision questions only to the female members of a family. In this paper we use female and mother interchangeably since we restrict our sample of children whose both parents are alive. The idea of using principal components for constructing an autonomy index can be extended to any woman within a family.

autonomy in family decision-making is more likely to influence secondary enrollment.[6]

Our identification strategy proceeds in two parts. First, we exploit the longitudinal nature of the data by using lagged values for independent variables. Second, we use instrumental variables to address the concern that the results might be driven by omitted unobserved variables. We use the relative geographical proximity of husband and wife's parents, as a determinant of mother's autonomy. This is a valid instrument if it induces variations in mother's autonomy but is uncorrelated with other individual characteristics that affect both female autonomy and schooling of children. We find that relative proximity does significantly explain autonomy.

While proximity to only wife's parents is likely to raise her autonomy, it might also improve child outcomes independently through greater child care. We have used relative closeness to mother's vis-a-vis father's parents. Since there is no a priori reason why a child's paternal grandparent will care about her more(less) than her maternal grandparents, the relatively proximity measure is likely to be exogenous care-giving.

Further concerns regarding the exogeneity of the instrumental variable arise if individual characteristics determine both child outcomes and grandparental proximity. We utilize information on the birth location of grandparents to construct our instrument. To the extent that birth locations are exogenous, our model is identified by the correlation between birth location and current location of grandparents. We provide further evidence that, in Mexico, individuals do not principally move to relocate themselves close to family or to get away from them. Migration decisions are mainly driven by employment and education considerations. Overall, our findings indicate that while relative grandparental proximity is a strong predictor of mother's autonomy, it is unlikely that variations in grandparental proximity are correlated with unobserved characteristics that affect

[6]In this paper we use female and mother interchangeably since we restrict our sample of children whose both parents are alive. The idea of using principal components for constructing an autonomy index can be extended to any woman within a family.

child outcomes. Identification issues have been discussed in more detail in section 4.

We find that the benefits of greater autonomy of mothers are restricted to younger boys. For instance, our estimates suggest that if the decision regarding child's education is taken by mothers instead of fathers, decision-making on other variables remaining the same, the probability of dropout decreases by 1.62 percentage points for boys in the 10-14 age group.[7] However, we do not find any improvement in the education outcomes of girls or older boys, with greater autonomy of mothers. Our analysis also sheds light on the mechanism through which benefits from higher autonomy of mothers accrue differently to boys and girls. Boys seem to gain at the expense of girls within the mixed-sex-sibling families. There is no effect of autonomy on boys for families with only sons.

These findings have important implications for the new trend in global development policy - conditional cash or in-kind transfers handed out directly to the female member of a family. This is particularly relevant in Mexico, where large sums of money are spent on programs like Progesa (or the more recent Oportunidades), that are targeted towards women. Our results caution against these ambitious policies directed towards women. While we do find significant improvement in the education of boys when mothers have greater decision making power, our findings also suggest an apparent redistribution of resources from boys to girls in families with higher mother's autonomy. The relevant policy question is whether a shift in the control over resources from men to women would improve the welfare outcome of children. We show that it may not necessarily be the case even when the women in the family themselves choose how to spend the money.

The rest of the paper is organized as follows. We discuss the Mexican Family Life Survey dataset in the next section. We present the logic of using principal component analysis to form a measure of female autonomy in section 3. The following two sections specify our empirical model

[7] Changing one decision leads to a change in the value of the index leading to a change in outcome variable. This is discussed in detail in section 5.

and identification strategy and discuss our empirical findings respectively. We conclude our paper by summarizing our findings and discussing their policy implications.

2 Data and Descriptive Statistics

The dataset comes from the Mexican Family Life Survey (MxFLS) - a nationally representative longitudinal household survey in Mexico. There are two waves of the data. The first round of survey took place in 2002, and a sizeable proportion of individuals were tracked in 2005 resulting in a two-year panel.

The survey contains detailed information on a wide range of individual and household characteristics, including household demographics, dwelling characteristics,household financial and non-financial assets, household member income and education levels (thereby helping us construct parental education), household consumption and household labor supply. In addition, as expounded in more detail in the next section, the survey interviews each adult member of the household about various aspects of household decision-making allowing us to look into the black box of intra-household decision-making and power-sharing. Finally, there is information on spatial characteristics such as municipality, locality and urbanity which we use to control for spatial effects.

Please insert Table 1 here

Table 1 provides some basic characteristics of the data. There are 8044 households surveyed in 2002 and 8114 in 2005, respectively. Approximately 20% of the households are female-headed suggesting that decision-making power within a family still lies mostly with men. Additionally, only 20% of the female household heads are married implying that women generally run households only in the absence of male members. This information is probably banal in the context of

most developing countries, but supports the fact in our context that women lack autonomy in decision making as a cultural default and a variation in such autonomy and its implications are no trivial questions. Female household heads also have significantly lower education. While nearly 40% of the male household heads have secondary education, the number is only 27% for the female household heads. A similar trend is present for workforce participation. Roughly speaking, the female workforce participation rate is about half of the male counterpart. Together, these statistics show us that Mexican families surveyed here are similar to the general experience of gender imbalance in developing countries - women study less, work more at home, earn lower wage income, and are less likely to run families while a man is around.

Please insert Table 2 here

Table 2 profiles primary and secondary school enrollment for children aged between 5 and 16 years. Not surprisingly, primary enrollment is almost universal (more than 96%), but secondary enrollment has lagged behind, both for 2002 and 2005. [8] Interestingly, while the primary enrollment rate is slightly higher for girls in the age group of 10-12 years, it is less than the boys in the next age group of 13-16 years suggesting that proportionally more girls drop out at the secondary level.

3 Measuring Female Autonomy - A Principal Component Approach

The MxFLS survey includes questions on various decision making aspects which are asked to both adult male and female members of the household. In our case, we consider decision-making only

[8] This is consistent with the aggregate, country-level data reported by World Bank (WDI, 2010). According to this database, net primary enrollment was 97.22% and 97.78% respectively for 2002 and 2005. However, secondary enrollment was only 61.65% in 2002, but grew to 67.57% in 2005.

by the adult members who have children. In other words, we are interested in the decision-making of parents, and consequently, welfare of their children. We consider the decisions made on the following 12 categories: household food consumption, husband's clothes, wife's clothes, child's clothes, child's education, child's health, expenditure on durable assets, transfers made to parents or relatives of the husband, transfers made to parents or relatives of the wife, husband's labor force participation, wife's labor force participation and the use of contraceptives.

Each household member is asked about his(her) perception of who makes the decision in each of these categories, but we focus only on the responses of the parents in cases where both parents are alive. Moreover, we construct the female autonomy indices based on the father's responses rather than the mother's perception. In other words, our index, Mother's Autonomy Index (henceforth, MAI) can be thought of as an indicator of the degree of autonomy the husband is willing to give his wife.[9]

For any parent-child-combination i, we assume that with respect to a particular decision category, female autonomy is strongest when husband(i) perceives that his wife(i) takes the decision in that category. On the other hand, female autonomy is weakest when the husband(i) perceives that he himself takes the decision in that category. The perception that both are involved in decision making lies somewhere in between.

One way of computing an index would be to compute the average proportion of categories in which the husband thinks his wife makes the decision. However, this method assumes equal weight for all categories in determining overall bargaining power within the marriage, which need not be the case. For example, the husband can choose to let the wife decide on her own about her

[9]MxFLS is somewhat unique in asking these questions to both husbands and wives. Other surveys such as DHS and ENADID in Mexico ask these questions to only the female members of the family. We believe that in a mostly patriarchal society (see our discussion about households being mostly headed by male members), a male member's perception about the decision making autonomy of female members is a more accurate measure of female autonomy than their own perception of self-autonomy.

clothes, probably a less important category, but keep the decision on her labor force participation to himself. Hence we adopt an alternative strategy and let the variability in the data decide how much weight to put on each category.[10] For each decision category, we create a categorical variable that equals 3 when the husband thinks that his wife takes the decision, equals 2 when he thinks that both take the decision and equals 1 when he thinks that he takes the decision. We use factor analysis to determine the weights that each decision category is assigned, similar to Filmer and Pritchett (2001). We then use the first principal component as a measure of female autonomy as perceived by her husband. In our sample, the first principal component explains about 25% of the variability in the data.

3.1 Method

Intuitively, the principal components approach helps reduce dimensionality of the data, while capturing the underlying variability. It produces mutually orthogonal linear combinations (eigenvectors) of a set of variables that capture the common pattern in the data. The eigenvector that has the highest eigenvalue, (i.e. the linear combination that captures the highest variability) is the first principal component. Formally, the strategy underlying the principal component methodology is the following: Suppose we have k variables for k decision categories that together determine the bargaining power of the spouse within the marriage. Consider the following linear combinations:

[10] Nevertheless, we check the robustness of our results with average number of categories in which the mother makes decisions as a measure of her autonomy.

$$z_1 = a_{11} * x_1 + a_{12} * x_2 + ... + a_{1k} * x_k$$

$$z_2 = a_{21} * x_1 + a_{22} * x_2 + ... + a_{2k} * x_k$$

$$z_k = a_{k1} * x_1 + a_{k2} * x_2 + ... + a_{kk} * x_k$$

Where x_k is the variable denoting who takes decision in the kth category. In our case, $k \in \{1,2,,12\}$ and $x \in \{1,2,3\}$. For example, suppose category two is child's education.Then x_2 takes a value 3 only if the mother takes decision about her child's education. Likewise, x_2 takes a value 1 for the household where only the father makes decisions about the child's education. Principal components maximize the variance $V(z_1)$ subject to the restriction that $a_1'a_1$=1. The normalization of eigenvectors a_i to unity is done because if any z_1 (eigenvalue) maximizes $V(z_1)$ any other vector nz_1 will also have the same property. Thus principal component analysis minimizes the sum of the squared perpendicular distances. z_1 is called the first principal component and is the linear combination that has the highest variance. Similarly, way we can find the kth principal component, the vector Xa_k , which maximizes $z_k'z_k$ subject to the normalization $a_k'a_k$=1 and subject to the additional restriction that these principal components are orthogonal to each other. The variances of the k principal components decrease from 1 through k (i.e. $V(z_{k-1}) > V(z_k)$).[11] Table 3 provides a summary of the index, the first principal component, in our sample. The mean value of the index is zero by construction. The standard deviation is 1.63. Recall that each decision category takes a value of 1, 2 or 3 depending on whether only father decides, both parents decide or only mother decides, respectively.

[11] An ad hoc strategy to construct an index of the mother's autonomy would be to set the weights $a_(ij) = 1$ (for all i and j) and then use the average of all categories. We use that index for testing the robustness of our results.

Please insert Table 3 here

Thus, if a category moves from the 1 to 2 (or 2 to 3), the index increases by the amount of its weight. For example, the index of female autonomy increases by approximately 0.87 units when the decision about child's education is taken by both parents as opposed to only by the father. However, female autonomy is higher by (0.87*2) 1.8 units when the decision is taken only by the mother as opposed to only by the father. In other words, as explained before, the weights in column 4 indicate the relative importance of each category in the construction of the index, where they are themselves determined by their variability in the data. Thus, a child's education decision seems to be the most important variable with regard to female empowerment, followed by decisions about child health.

3.2 Validation

One way to validate whether our index truly reflects female autonomy within marriage is to check its association with other measures of bargaining power or female autonomy that have been used in the literature. While there is a dearth of direct measures of female empowerment, the literature on power sharing within marriage outlines several important correlates of female bargaining power viz. parental education, outside options (employment status) and parental age among other things.

Table 4 illustrates the relationship between various parental characteristics and our index of female autonomy. Specifically, if we compare the high (75th percentile) and the low (25th percentile) ends of the distribution of the female autonomy index, we find that in the households characterized by higher female autonomy, mothers are more likely to have completed secondary education, younger in age and slightly more likely to be employed. The same is true for the father's characteristics.

Please insert Table 4 here

However, we do not find a significant difference in urbanization between households with high and low female autonomy.

3.3 Mother's Autonomy and Child Education - Stylized Facts

Given the evidence on the validity of our index, we next turn to our second question in the paper - whether mother's autonomy in decision making affects child outcomes. The basic idea behind our regression strategy is illustrated in table 5.

Please insert Table 5 here

As before, high and low are defined as greater-than-75th and lower-than-25th percentile of the distribution of MAI, respectively. It shows the differences in the percentages of enrollment for the children with high and low degrees of mother's autonomy in decision making. Enrollment drops significantly as children progress from lower to higher secondary. However, a comparison of rows 1 and 2 shows that the drop in enrollment is much higher for lower levels of Mother's Autonomy. For male children, while enrollment drops by 24 percentage points in households with higher Mother's Autonomy, it drops by 32 percentage points in households in the bottom 25% of the Mother's Autonomy distribution, similarly for girls.

4 Regression Specification and Identification Strategy

4.1 Effects of Mother's Autonomy on her child's Retention in secondary school

While the descriptive evidence in Table 5 suggests that children with more autonomous mothers have a higher rate of secondary enrollment on an average, it does not imply any causal link. Omitted variables may drive both education choice and mother's autonomy. Hence, we turn to a formal analysis to see if there exists a causal relationship between mother's autonomy and child outcomes. We first look at the secondary enrollment outcome of the students in 2005 with the lagged value of mother's autonomy from 2002 to ameliorate the simultaneity problem.[12] However, this measure can be imprecise because it includes students who were never enrolled in the first place in 2002, the year from which the autonomy index variable comes. Therefore, we also look at secondary enrollment of students who are 10-14 years old in 2005 conditional on the criterion that they were enrolled in school in 2002, either primary or secondary. Accordingly, if a student is not enrolled in secondary school in 2005, then she is categorized as a dropout. We also control for several candidate alternative explanations cited in the literature such as wealth and parental education.

Formally we start with estimating the non-linear regression equations of the following form:

$$O_{i,2005} = \beta_0 + \beta_1 * MAI_{i,2002} + X_i * \gamma + u_i, \tag{1}$$

where for each individual child i, $O_{i,2005}$ is the respective binary outcome variable, $MAI_{i,2002}$ is the measure of mother's autonomy within a family in 2002, and X is the matrix of control variables that includes various individual, parental and household characteristics such as gender, age, family

[12] Since our dependent variable is binary, using an individual fixed-effects model is problematic as pointed out by Fernandez-Val (2009).

wealth and parental education. Our main coefficient of interest is β_1, in terms of the direction of change. We provide the marginal coefficients from the latent model to understand the magnitude of the effect. $O_{i,2005}$ represents secondary enrollment dummy in the first specification, which is equal to unity if the relevant child is enrolled in school in 2005; it represents secondary dropout in the second specification where it is equal to unity if the relevant child is not enrolled in school in 2005, but was enrolled in 2002, either at the primary or at the secondary level.

4.2 Instrumental Variable Strategy

While using a lagged value of MAI by exploiting the panel structure of the data accounts for any concerns of simultaneity, it cannot address the possibility of omitted variable biases. To account for both measurement error and omitted variable biases, we construct an instrumental variable by combining insights from the other social science literature and the pattern of domestic migration in Mexico.[13] Our instrumental variable strategy is based on the twin observation that proximity to natal kin increases female bargaining power within her family, and forces behind location choice of agents are exogenous to the autonomy-child education relationship. In particular, the MxFLS asks all adult household members whether their parents were born in the same locality (in geographic terms, this is a subcategory of municipality) as they currently live in or whether they were born in a different locality. Husband's parents are proximate if the couple lives in the same locality as where the husband's parents (either of the parents) were born. On the other hand, wife's parents are proximate if the couple lives in the same locality as where the wife's parents (either of the parents)

[13]The previous literature has used a wide range of variables as exogenous determinants of female autonomy or bargaining position of female within marriage. For example, Hoddinott and Haddad (1995) use relative income while Schultz (1990) and Thomas (1990) use non labor income as proxy for bargaining power. Others have used current or inherited assets (Doss 1999, Quisumbing 1994). Brown (2009) uses dowry to proxy for bargaining position and then goes on to instrument dowry by grain shocks. However, most of these methods make strong assumptions about exogeneity. Finally, there are studies that use changes in divorce laws or other exogenous policies to proxy for female bargaining position. (Lundberg, Pollak and Wales 1997; Chiappori, Fotin and Lacroix 2002).

were born.[14] We construct relative parental proximity as a categorical variable that takes the value 3 when only wife's parents are proximate, the value 2 when both the husband and wife's parents are proximate or none is proximate and the value 1 when only husband's parents are proximate. For example, we define wife's parents to be proximate (in absolute sense) when either the wife's mother, or her father or both live in the same locality. Husband's parental proximity is defined similarly.

Sociological and anthropological literature has long documented that proximity to the natal kin influences women's position within marriage. For example, Dyson and Moore (1983), argue that patrilocal kinship structures like village exogamy in marriage leads to lower autonomy of women. By contrast, matrilocal kinship systems endow greater autonomy to women. Yanca and Low (2004) and Chen (2004) provide evidence in different contexts that geographic proximity to the natal kin positively influences various indicators of female empowerment like control over household resources or household work arrangement. Therefore, empirically, relative proximity of the wife's parents should be positively correlated with her autonomy. However, to be a valid instrument, the proximity measure should be excluded from the structural equation - i.e. proximity should not directly affect the outcome variable, nor should parental proximity be determined simultaneously with female autonomy.

It is conceivable that proximity to the wife's parents can improve child outcomes not only through her improved bargaining position but also through care-giving from maternal grandparents to grandchildren. On the other hand, proximity to husband's parents may have a similar independent effect on child outcomes other than the effect through the lowering the bargaining position of the wife. Our relative proximity measure, however, is likely to affect child outcomes only through MAI since there is no a priori reason to believe that there exists systematically differential

[14]This is the minimum spatial unit in the survey.

care-giving to grandchildren from the two sets of grandparents.

To understand the other threats to the exogeneity of our instrument concerns, first consider the case that proximity to respective parents might be determined as a result of selective migration of spouses towards or away from their respective parents. However, investigating the reasons for movement within Mexico, we find that employment is the most important determinant of migration for the adult members of the household (please refer to Appendix Table A1). With motive of moving close to, or away from, family explaining only 1% of overall adult migration in Mexico, it is unlikely that our instrument of relative proximity is determined by systematic migration of spouses towards their respective parents. Moreover, note that for the instrument to be invalid, the husband (wife) must choose to relocate away from his own parents and specifically locate closer to his wife's (husband's) parents. In general, this appears to be a rare scenario.[15]

Finally, our IV would also fail if proximity is determined by the current location of grandparents who endogenously choose to move to a locality where adult sons or daughters currently live. For example, parents of a pro-active wife could choose to move close by raising her autonomy level. The omitted variable, "pro-activeness" of the wife might affect both parental proximity and child outcomes in this case.

In order to avoid concerns of endogenous living locations of grandparents, our identifying instrument is based on the exogenous birth locations of grandparents. Since birth locations are arguably exogenous and are correlated with current locations of grandparents, our model is identified by this correlation of current locations to birth locations. We define husband's parents to be proximate if the couple lives in the same region as where the husband's parents were born. On the other hand, wife's parents are proximate if the couple lives in the same region as where the wife's parents were born.

[15]We do not exclude those families because we wanted to avoid having a selected sample and to not lose sample size further.

Next we provide evidence on the "relevance" of our instruments - that relative parental proximity of spouses and MAI are indeed correlated.

Please insert Table 6 here

Table 6 shows the effect of the relative proximity of wife's parents to husband's parents on the index of female autonomy. Relative proximity of wife's parents has a significant positive impact on the relative decision making power of wives and the coefficient remains unchanged with the inclusion of various controls. Moreover, as the last column shows, when we separate out the indicators of wife's parent's proximity and husband's parent's proximity, it is the proximity of the former that increases female autonomy; female autonomy decreases when the husband's parents live nearby (however, the coefficient is imprecisely estimated). Given that our relative proximity measure strongly predicts MAI we present Two Stage Least Square (TSLS) estimates of model (1) to allay any endogeneity concerns arising from unobserved heterogeneity.

5 Discussion of Results

5.1 Secondary Enrollment

Probit estimates of the effects of mother's autonomy on child's secondary school enrollment status are shown in table 7. The estimates are provided separately for lower secondary (10-14) and higher secondary (15-16) age groups. The estimates in column 1 suggest that mother's autonomy is positively and significantly associated with enrollment in the lower secondary school. However MAI does not seem to matter for education status at upper secondary levels (column 4). As expected, enrollment decreases at higher ages. Father's education seems to be a robust predictor of overall secondary enrollment. Surprisingly, wealth, proxied by landholding, does not have an effect on

secondary enrollment.

Please insert Table 7 here

However, when we decompose the sample into boys and girls, only boys seem to benefit from greater autonomy of their mothers. MAI does not have a significant impact on secondary schooling for girls in either of the age categories. The marginal estimates corresponding to the probit estimates in column 2 are reported in column 1 of table 11. The estimates suggest that a 1 percentage point increase in MAI leads to 1.3 percentage point increase in probability of secondary enrollment for a child whose mother has mean MAI.[16]

5.2 Secondary Dropout

Table 8 reports the educational status of the child in 2005 conditional on the fact that the child was enrolled in school in 2002. In particular, our dependent variable is the probability of dropping out while still in the school going age. As before, columns 1-3 show results for children who are 10-14 years old and columns 4-6 show results for children who are 15-16 years old.

Please insert Table 8 here

Mother's autonomy index has a negative and significant impact on dropout from secondary school in the 10-14 age group but has no effect on higher secondary schooling. Again this result holds only for boys, not for girls. The marginal effects imply that a one unit increase in MAI leads to a 1 percentage point fall in the dropout rate (table 11, column 2).

[16] All marginal effects are calculated at the mean value of MAI and the results are summarized in Table 11 to avoid clutter.

5.3 Results Using Instrumental Variables

We now turn to the instrumental variable estimates. As argued above, our measure of relative grandparental proximity induces variations in MAI but is uncorrelated with underlying variables that affect both schooling and MAI. The instrumental variable estimates are reported in table 9 (enrollment) and table 10 (dropout). We restrict our attention to the younger age group, because as shown above, education outcomes at the higher levels remain indifferent to the variations in mother's autonomy.[17]

Please insert Table 9 here

Please insert Table 10 here

Please insert Table 11 here

The IV estimates confirm that greater mother's autonomy leads to higher enrollment and lower dropout for boys. The marginal effects for the enrollment and dropout results are reported in columns 3 and 4 respectively of Table 11. To understand the magnitude of the effect, consider the dropout results in column 4. Overall, a one percentage point increase in MAI implies a 3 percentage point fall in the dropout rate. In particular, a shift in the decision making power from fathers to mothers, in the category of child's education for instance, reduces the probability of dropping out from school by 5.7 percentage points. [18] All IV coefficients are larger than their

[17] Similar results are obtained from a linear 2SLS specification also. While we have not reported them here to avoid clutter, they are available upon request.

[18] To see this, note that from (1),

$$MAI = \sum_i w^i (d_3^i - \overline{d_3^i}) = \sum_i w^i d_3^i - \sum_i w^i \overline{d_3^i}$$

Let us consider the category education (i=5).

In this category, $w_5 = 0.87$ (from author's calculation). If d_3^5 changes from 1 to 3 (decision taken by father alone to decision taken by mother alone), then MAI increases by 0.87*2 = 1.8 units. To see the eventual impact on dropout, let

probit counterparts. Given the nature of potential omitted variable bias in this situation, it is not a priori straightforward as to which way the probit estimates will be biased. For example, suppose the omitted variable from equation (1) is the relevant student's IQ, a staple variable in the labor literature. It is not straightforward if this leads to higher autonomy for the mother (where the father wants to give more decision space to wife, or wants more autonomy for himself). However, since our IV estimates are bigger than the probit estimates for both outcome variables, it may be the case that for more able children, the father takes over the decision-making (so that the correlation between IQ and mother's autonomy will be negative creating a downward bias for the positive probit estimates). Contrary to the boys, IV results for girls in lower secondary school (Column 2, Table 10) imply that higher mother's autonomy leads to higher dropout rates for girls. At first glance this might appear to be counter intuitive. However, a closer look reveals that intra household dynamics might be driving the results. We deal with this issue in further detail in section 7.

6 Robustness Checks

In this section, we perform a couple of sensitivity analysis to see if our results are robust to various alternative definitions of mother's autonomy. In particular, we construct an index of mother's autonomy using two alternative approaches: (i) from the responses of the mothers and (ii) the average number of all categories in which the mother takes decisions within the family.

us consider the estimated marginal effect from the IV regression for boys in the 10-14 age group i.e. for $\beta_1 = 0.322$. i.e. a 10 percentage point increase in MAI results in a 3 percentage point reduction in the dropout rate. Therefore, a switch in decision-making power, for child's education, in favor of the mother leads to 5.7 (1.8*3.2) percentage points decline in the probability of dropout.

6.1 Index using mothers' responses

Evidence from MxFLS survey shows that not only are the actual decisions taken by different members of the family, but also perceptions differ with respect to who takes decision in particular categories. Hence the mother's response to questions of who takes household decisions do not necessarily match that of father's response. Therefore, we construct the same index using the mother's responses and estimate the same model. The results are presented in Table 12

Please insert Table 12 here

Table 12 is estimated in the same way as Table 9, controlling for all relevant variables as before. Results from Probit and IV estimations are reported in column (1) and (2) respectively. The results are qualitatively the same as before - greater autonomy of mothers leads to lower dropout for sons, and the IV estimates are higher than the Probit estimates.

6.2 Index using average number of categories

As discussed above, a more common approach in this literature is to work with average number of categories in which a mother makes the decision as a measure of her autonomy.[19] Panel B in Table 12 presents results from estimating the same model with the Mother Autonomy Index being calculated as proportion of cases in which the mother of a child takes decision alone.

Looking at Panel B and comparing the results with row 1 in Table 12, we see again that the results are qualitatively similar. Together, these tables show us that the positive causal relationship between greater autonomy of mothers and better lower secondary education of sons is robust to differences in the specification and definition of MAI. We next turn to investigate the gender differences in results.

[19] See Jensen and Oster (2010) among others.

7 Discussion of Gender Differences in Results

While differences in outcome between boys and girls are not new in developing countries, the reason is often complex and specific to the underlying social, economic and institutional features. A comprehensive analysis of the conflict of gender interests for children is beyond the scope of this paper. However, one important question in the intra-household resource allocation is whether boys and girls compete with each other for resources. This effect can be confounded in the regression analysis comprising the entire sample as no distinction is made between families with single sex children and families that have both boys and girls in the secondary school age group. To test this hypothesis, we divide our sample between mixed-gender sibling families (families with at least one boy and one girl) and single-gender sibling families (families with male only or female only siblings). Then we estimate the same model, in (1), separately for them. Results from this estimation have been presented in table 13.[20]

Please insert Table 13 here

Column 1 shows results for mixed-gender families. These results are qualitatively similar to that of our main results in table 9. However, for columns 2 and 3, showing results for boys-only and girls-only families, mother's autonomy is not a significant variable in explaining dropout anymore. These results point out the possibility that higher autonomy for mothers, as opposed to the previous literature, leads to greater resource allocation to young boys within mixed-gender families.

[20] We restrict our analysis to Probit estimates in this case, as the sample size is too small for meaningful IV estimations.

8 Summary and Policy Implications

Economists and policymakers have long engaged in answering the question whether a dollar in the hands of a female member in the family has the same welfare effects as a dollar in the hands of a male member. Even though unitary household models, where the benevolent household head maximizes total household welfare and distributes among members, assumes away such distinction, some empirical evidence shows that female members spend money in a way that is more amenable to the welfare improvement of children. These studies have been influential in shaping development policies around the world that have directed cash or in-kind subsidy towards the female household members. However, unless we have a measure of female autonomy, we will not know the effectiveness of this line of policy-making. In other words, unless we know the true underlying relationship between women's involvement in household decision making and child welfare, the effects of gender sensitive policies will be confounded. This paper fills this gap in two ways. We first create a direct measure of female autonomy exploiting the rich nature of Mexican Family Life Survey Data and then examine the effects of such autonomy for mothers on their secondary school-going children. Our autonomy measure is based on household member responses and not inferential. We also investigate the causal link between autonomy and childs education. Our results are mixed. While we do find that greater mother autonomy is better for her child's education (children of mothers with higher autonomy have less dropout incidence and higher enrollment); we find that this effect is weak for older children and particularly for girls. In fact, boys seem to have significantly better outcomes in households shared by both male and female children. Our results thus caution policymakers that gender-directed policies may not necessarily hasten the process of equitable development.

References

Anderson, Siwan, and Mukesh Eswaran. 2009. What determines female autonomy? Evidence from Bangladesh. *Journal of Development Economics* 90 (2) (11): 179-91.

Angelucci, M. 2008. Love on the rocks: Domestic violence and alcohol abuse in rural Mexico. *The BE Journal of Economic Analysis & Policy* 8 (1): 43.

Angelucci, M., G. De Giorgi, M. A. Rangel, and I. Rasul. 2010. Family networks and school enrolment: Evidence from a randomized social experiment. *Journal of Public Economics* 94 (3-4): 197-221.

Ashraf, Nava. September 2009. Spousal control and intra-household decision making: An experimental study in the Philippines. *The American Economic Review* 99 (4): 1245-77.

Attanasio, O., and K. Kaufmann. 2009. Educational choices, subjective expectations, and credit constraints. NBER Working Paper 15087.

Becker, G. S. 1991. *A treatise on the family* Harvard University Press, Cambridge, MA.

Bobonis, G. J., R. Castro, and M. González-Brenes. 2007. Public transfers and domestic violence: The roles of private information and spousal control. *Unpublished Manuscript, Department of Economics, University of Toronto*.

Brown, P. H. 2009. Dowry and intrahousehold bargaining: Evidence from China. *Journal of Human Resources* 44 (1): 25.

Chattopadhyay, R., and E. Duflo. 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica* 72 (5): 1409-43.

Chen, Feinian. 2004. The division of labor between generations of women in rural china. *Social Science Research* 33 (4) (12): 557-80.

Chiappori, Pierre-André, Bernard Fortin, and Guy Lacroix. 2002. Marriage market, divorce legislation, and household labor supply. *The Journal of Political Economy* 110 (1) (Feb.): 37-72.

Doss, Cheryl. 2006. The effects of intrahousehold property ownership on expenditure patterns in Ghana. *Journal of African Economies* 15 (1): 149-180.

Duflo, E., and R. Chattopadhyay. 2004. Women as policy makers: Evidence from a randomized policy experiment in India. *Econometrica* 72 (5): 1409-43.

Dyson, T., and M. Moore. 1983. On kinship structure, female autonomy, and demographic behavior in India. *Population and Development Review* 9 (1): 35-60.

Fernández-Val, Iván. 2009. Fixed effects estimation of structural parameters and marginal effects in panel probit models. *Journal of Econometrics* 150 (1) (5): 71-85.

Filmer, D., and L. H. Pritchett. 2001. Estimating wealth effects without expenditure data-or tears: An application to educational enrollments in states of India. *Demography* 38 (1): 115-32.

Folbre, N. 1984. Household production in the Philippines: A non-neoclassical approach. *Economic Development and Cultural Change* 32 (2): 303-30.

Goldin, Claudia, and Lawrence F. Katz. 2000. Career and marriage in the age of the pill. *The American Economic Review* 90 (2, Papers and Proceedings of the One Hundred Twelfth Annual Meeting of the American Economic Association) (May): 461-5.

Hoddinott, J., and L. Haddad. 1995. Does female income share influence household expenditures? Evidence from Côte d'ivoire. *Oxford Bulletin of Economics and Statistics* 57 (1): 77-96.

Hotchkiss, Julie L. 2005. Do husbands and wives pool their resources?: Further evidence. *Journal of Human Resources* XL (2) (April 1): 519-31.

Jensen, Robert, and Emily Oster. 2009. The power of TV: Cable television and women's status in India. *Quarterly Journal of Economics* 124 (3) (08/01; 2011/02): 1057-94.

Kantor, P. June 2003. Women's empowerment through home-based work: Evidence from India. *Development and Change* 34 (3): 425-45.

Lee, J. 2007. Marriage, the sharing rule, and pocket money: The case of South Korea. *Economic Development and Cultural Change* 55 : 557-81.

Lundberg, Shelly J., Robert A. Pollak, and Terence J. Wales. 1997. Do husbands and wives pool their resources? Evidence from the United Kingdom child benefit. *The Journal of Human Resources* 32 (3) (Summer): 463-80.

Oreffice, S. 2007. Did the legalization of abortion increase women's household bargaining power? Evidence from labor supply. *Review of Economics of the Household* 5 (2): 181-207.

Pitt, M. M., S. R. Khandker, and J. Cartwright. 2006. Empowering women with micro finance: Evidence from Bangladesh. *Economic Development and Cultural Change* 54 (4): 791-831.

Quisumbing, A. R. 1994. Intergenerational transfers in Philippine rice villages:: Gender differences in traditional inheritance customs. *Journal of Development Economics* 43 (2): 167-95.

Rahman, Lupin, and Vijayendra Rao. 2004. The determinants of gender equity in India: Examining Dyson and Moore's thesis with new data. *Population and Development Review* 30 (2) (Jun.): 239-68.

Reggio, Iliana. The influence of the mother's power on her child's labor in mexico. *Journal of Development Economics* In Press, Corrected Proof .

Schultz, T. Paul. 1990. Testing the neoclassical model of family labor supply and fertility. *The Journal of Human Resources* 25 (4): 599-634.

Thomas, Duncan. 1990. Intra-household resource allocation: An inferential approach. *The Journal of Human Resources* 25 (4) (Autumn): 635-64.

Ward-Batts, Jennifer. 2008. Out of the wallet and into the purse: Using micro data to test income pooling. *Journal of Human Resources* 43 (2) (April 1): 325-51.

Yanca, Catherine, and S. Low Bobbi. 2004. Female allies and female power: A cross-cultural analysis. *Evolution and Human Behavior* 25 (1): 9-23.

Table 1: Characteristics of household heads in Mexican family life survey

	2002			2005		
Variable	Male HH Head	Female HH Head	Total	Male HH Head	Female HH Head	Total
Age	46.2094	51.8129	47.344	47.4051	54.5806	48.9135
	(15.1624)	(16.5693)	(15.6198)	(15.5882)	(16.1963)	(15.9866)
HH Size	4.4298	3.4546	4.2322	4.7396	3.9719	4.578
	(1.9873)	(2.0407)	(2.0362)	(2.2275)	(2.402)	(2.2867)
Married Dummy	0.7799	0.1933	0.661	0.7715	0.1786	0.6467
	(.4144)	(.395)	(.4734)	(.4199)	(.3831)	(.478)
Secondary and Above	0.4177	0.2748	0.3887	0.4288	0.2758	0.3966
	(.4932)	(.4466)	(.4875)	(.4949)	(.447)	(.4892)
Working for Last 12 Months	0.8843	0.4859	0.8036	0.8581	0.4501	0.7723
	(.3199)	(.5)	(.3973)	(.3489)	(.4977)	(.4194)
Land Owner	0.2109	0.1393	0.1964	0.1733	0.1159	0.1612
	(.408)	(.3463)	(.3973)	(.3785)	(.3202)	(.3677)
House Owner	0.7741	0.7571	0.7706	0.7938	0.7699	0.7888
	(.4182)	(.429)	(.4204)	(.4046)	(.421)	(.4082)
Observations	6414	1630	8044	6406	1708	8114

Note: Standard deviations are in parentheses

Table 2: Primary and secondary school enrolment

Age	All	Male	Female
5-9	.9602	.969	.9514
	(.1955)	(.1734)	(.215)
	3292	1645	1647
10-12	.9723	.9691	.9755
	(.1642)	(.1731)	(.1548)
	2704	1359	1345
13-16	.7802	.7925	.7682
	(.4142)	(.4057)	(.4221)
	3430	1696	1734

Notes:
1. Pooled data for 2002 and 2005
2. Each cell represents proportion of students enrolled.
3. Standard deviations are in parenthesis.
4. The third row represents numbers of observations.

Table 3: Mother's Autonomy in different categories of decision-making

	Scoring Factors	Mean	Std. Dev.	weights = Score/SD
MAI		0	1.63	
Decision Category				
Food	0.1249	2.4046	0.6815	0.1832722
Father's clothes	0.1341	1.6016	0.7912	0.1694894
Spouse's clothes	0.0812	2.6334	0.6418	0.1265192
Child clothes	0.4482	1.8556	0.7978	0.5617949
Child education	0.5036	1.8033	0.5749	0.8759784
Child health	0.4896	1.8238	0.5839	0.8384997
Durable expend	0.1961	1.6978	0.5666	0.3460995
Transfer to parents-relative	0.2579	1.4917	0.5705	0.4520596
Transfer to spouse parents-relative	0.2388	1.843	0.7238	0.3299254
Father LFP	0.1307	1.3706	0.5943	0.2199226
Spouse LFP	0.0491	2.0701	0.7937	0.0618622
Contraceptive	0.2901	1.7081	0.5511	0.5264017

Notes: The mean is the proportion of cases in which the mother decides when we define decision as a binary taking value one when only mother decides and zero otherwise

Table 4: Characteristics of parents and relation to mother's autonomy

	All			MAI high			MAI low		
Variables	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
M Age	16817	36.87	8.84	4210	35.65	8.14	4205	40.25	9.75
M Sec Edu	16836	0.42	0.49	4210	0.45	0.50	4211	0.32	0.47
M Employ	16836	0.26	0.44	4210	0.28	0.45	4211	0.23	0.42
F Age	16811	40.50	10.00	4205	39.31	9.42	4202	44.20	10.79
F Sec Edu	16836	0.46	0.50	4210	0.46	0.50	4211	0.37	0.48
F Employ	16836	0.96	0.19	4210	0.97	0.17	4211	0.94	0.24
Urban	16836	0.55	0.50	4210	0.56	0.50	4211	0.53	0.50

Notes: M represents Mother; F represents Father. M Age measures average age of mothers. M Sec Edu and M Employ indicate fraction of mothers with Secondary Education and Employment, respectively. Similarly for fathers. Urban indicates proportion of household located in the urban regions.

Table 5: Relationship between MAI and secondary enrolment

	MALE		FEMALE	
Age	10-14	15-16	10-14	15-16
MAI high	.9452	.7055	.9256	.7039
	(.2278)	(.4574)	(.2627)	(.458)
	511	146	484	152
MAI low	.9267	.6077	.9277	.5896
	(.261)	(.4896)	(.2593)	(.4931)
	341	181	401	212
One tailed P-value for H_a: $Enrol_{MAI\ high} > Enrol_{MAI\ low}$	0.13	0.03	0.54	0.01

Notes:
1. Standard deviations are in parenthesis.
2. The third row in each panel represents numbers of observations.

Table 6: Determinants of mother's autonomy – First Stage

Dependent Variable: MAI in 2002					
	(1)	(2)	(3)	(4)	(5)
Relative Proximity	0.102***	0.0922**	0.0998***	0.0805**	
	(0.037)	(0.037)	(0.037)	(0.037)	
Mother Education		0.0865***	0.0801***	0.0717***	0.0516***
		(0.02)	(0.02)	(0.021)	(0.016)
Father Education		-0.0353**	-0.0474***	-0.0435**	-0.0360***
		(0.017)	(0.018)	(0.018)	(0.013)
Urban			0.186***		
			(0.057)		
Land owner				0.0232	-0.0279
				(0.067)	(0.059)
Matrilocal					0.0947**
					(0.048)
Patrilocal					-0.0748
					(0.048)
Constant	0.472***	0.322***	0.284***	0.939***	0.935***
	(0.078)	(0.1)	(0.1)	(0.23)	(0.14)
Observations	2198	2198	2198	2198	3137

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 7: Probit Results: Effects of mother's autonomy on secondary school enrolment

Dependent Variable: Enrolment						
	10-14 All	10-14 Male	10-14 Female	15-16 All	15-16 Male	15-16 Female
	(1)	(2)	(3)	(4)	(5)	(6)
MAI	0.0812**	0.158***	0.0179	0.0309	0.0489	0.0140
	(0.041)	(0.058)	(0.055)	(0.040)	(0.068)	(0.051)
age	-0.234***	-0.175***	-0.286***	-0.391***	-0.517***	-0.295**
	(0.037)	(0.056)	(0.050)	(0.11)	(0.16)	(0.15)
Mother Edu	0.140	0.324	0.00234	0.632***	0.712***	0.619***
	(0.13)	(0.20)	(0.17)	(0.14)	(0.21)	(0.20)
Father Edu	0.421***	0.492***	0.470***	0.411***	0.620***	0.241
	(0.12)	(0.18)	(0.16)	(0.14)	(0.22)	(0.19)
Land owner	0.0336	-0.174	0.320*	-0.0334	0.0486	-0.113
	(0.12)	(0.16)	(0.18)	(0.12)	(0.19)	(0.17)
Male	0.115			-0.0194		
	(0.100)			(0.11)		
Constant	4.640***	3.270***	4.195***	5.895***	8.287***	4.873**
	(0.61)	(0.89)	(0.71)	(1.66)	(2.48)	(2.28)
Observations	1753	826	855	707	325	370

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 8: Probit Results: Effects of mother's autonomy on secondary school dropout

Dependent Variable: Dropout						
	(1)	(2)	(3)	(4)	(5)	(6)
	10-14 All	10-14 Male	10-14 Female	15-16 All	15-16 Male	15-16 Female
MAI	-0.0691	-0.149**	-0.00817	-0.0227	-0.0628	0.00925
	(0.042)	(0.060)	(0.057)	(0.041)	(0.069)	(0.053)
age	0.239***	0.179***	0.300***	0.354***	0.562***	0.174
	(0.037)	(0.058)	(0.053)	(0.11)	(0.16)	(0.15)
Mother Edu	-0.129	-0.365*	0.0421	-0.638***	-0.697***	-0.641***
	(0.13)	(0.21)	(0.17)	(0.15)	(0.22)	(0.21)
Father Edu	-0.453***	-0.538***	-0.505***	-0.339**	-0.588***	-0.144
	(0.13)	(0.19)	(0.17)	(0.14)	(0.23)	(0.19)
Land owner	-0.165	-0.0128	-0.405**	0.0616	0.00785	0.136
	(0.13)	(0.17)	(0.19)	(0.13)	(0.19)	(0.18)
Male	-0.149			0.0254		
	(0.10)			(0.11)		
Constant	-4.685***	-3.663***	-4.364***	-5.461***	-8.658***	-2.680
	(0.62)	(0.81)	(0.75)	(1.71)	(2.56)	(2.33)
Observations	1716	814	830	671	308	351

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 9: Instrumental variable results: Effects of mother's autonomy on secondary school enrolment

Dependent Variable: Enrolment			
	10-14 Male	10-14 Female	10-14 All
	(1)	(2)	(3)
MAI	0.891***	-0.749**	0.380
	(0.072)	(0.30)	(0.60)
age	-0.0658	-0.135	-0.204***
	(0.064)	(0.19)	(0.067)
Mother Edu	0.0468	0.241*	0.106
	(0.17)	(0.14)	(0.22)
Father Edu	0.293*	0.0313	0.234
	(0.16)	(0.16)	(0.15)
Land owner	-0.189	0.0200	-0.105
	(0.14)	(0.16)	(0.15)
urban	-0.0658	0.128	0.139
	(0.20)	(0.13)	(0.20)
Male			0.0258
			(0.13)
Constant	0.527	2.901	3.491**
	(1.25)	(2.95)	(1.53)
Observations	507	517	1024

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 10: Instrumental variable results: Effects of mother's autonomy on secondary school dropout

Dependent Variable: Dropout			
	(1)	(2)	(3)
	10-14 Male	10-14 Female	10-14 All
MAI	-0.900***	0.814***	-0.333
	(0.051)	(0.13)	(0.68)
age	0.0602	0.108	0.213***
	(0.052)	(0.13)	(0.068)
Mother Edu	-0.0504	-0.222*	-0.104
	(0.15)	(0.13)	(0.22)
Father Edu	-0.289**	-0.0264	-0.283*
	(0.14)	(0.14)	(0.16)
Land owner	0.155	0.0150	0.0783
	(0.13)	(0.14)	(0.15)
urban	0.107	-0.141	-0.151
	(0.15)	(0.12)	(0.23)
Male			-0.0366
			(0.15)
Constant	-0.356	-2.430	-3.668**
	(0.89)	(2.04)	(1.56)
Observations	502	500	1002

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 11 : Marginal effects: Mother's autonomy on secondary school dropout

	Probit		IV	
	Enrol	Dropout	Enrol	Dropout
MAI	0.013**	-0.010**	0.302**	-0.322***
	(0.005)	(0.004)	(0.134)	(0.075)
Age	-0.014***	0.012***	-0.022	0.022
	(0.004)	(0.004)	(0.016)	(0.016)
Mother Edu	0.025	-0.024	0.016	-0.018
	(0.015)	(0.014)	(0.053)	(0.051)
Father Edu	0.038**	-0.036**	0.098**	-0.102*
	(0.014)	(0.013)	(0.039)	(0.041)
Land Owner	-0.015	-0.001	-0.066	0.056
	(0.015)	(0.012)	(0.047)	(0.047)
Urban			-0.022	0.038
			(0.076)	(0.059)
Observations	826	814	507	502

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

Table 12: Robustness Checks:

Panel A: Mother's response; Panel B: Proportional measure

Dependent variable: Dropout(Male: 10-14 Years)		
	Panel A	
	(1)	(2)
	Probit	**IV**
MAI	-0.126*	-0.952***
	(0.07)	(0.055)
	Panel B	
MAI	-0.0811*	-0.494***
	(0.042)	(0.026)
Observations	795	486

Notes: Robust standard errors are in parenthesis.
*** significant at 1%, ** significant at 5%, * significant at 10%

All control variables from Table 9 are included in the estimation, but not reported to avoid clutter.

Table 13: Sibling sex composition and the effects of MAI on dropout

Dependent Variable: Dropout			
	Mixed Sex Sibling	Same Sex Sibling	
	10-14	10-14	10-14
	Male	Male	Female
MAI	-0.140**	-0.0745	-0.0977
	(0.062)	(0.13)	(0.12)
age	0.133*	0.291***	0.271***
	(0.073)	(0.095)	(0.067)
Mother Edu	-0.447*	-0.267	0.101
	(0.27)	(0.33)	(0.24)
Father Edu	-0.325	-0.732**	-0.264
	(0.26)	(0.35)	(0.25)
Land owner	0.0132	-0.251	-0.742**
	(0.20)	(0.36)	(0.33)
Constant	-2.817***	-4.870***	-4.551***
	(0.86)	(1.19)	(0.85)
Observations	480	396	399

Notes: Robust standard errors are in parenthesis, *** significant at 1%, ** significant at 5%, * significant at 10%

Appendix Table 1: Motivations for migration in MxFLS

	Male	Female
Education/training of any home member	11.44	9.48
Going back to place of origin	7.03	4.97
Job of any household member	56.26	40.24
Marriage/union	4.9	23.27
Pregnancy	0.05	0.37
Death of the spouse/couple	0.16	0.33
Somebody else's death	0.63	1.02
Own or spouse's/couple's health	1.05	1.11
Health reasons of somebody else	1.03	1.82
To be closer to the family	7.31	7.45
For insecurity reasons	0.75	0.84
Because of political issues or disturbances	0.3	0.06
To be independent from your family	1.28	1.11
Like that place	2.45	2.21
Natural disasters	0.4	0.31
Deported	0.26	0.08
Other	4.69	5.34

Notes: Figures in each cell indicate the percentage of individuals, male or female, who migrated due to the corresponding reason.