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Abstract

We examine what happens to Sri Lankan men's labour supply when their wives emigrate to work and leave the husbands and children at home—the effects of maternal migration on the husbands' labour supply. Using sibling sex-composition of a household as an instrumental variable for the household's number of children in three-stage least-square estimations, we find maternal migration reduces the husbands' labour supply. The husbands are more likely to exit the labour market and become unemployed; the employed are less likely to moonlight and have lower wages; those that exit the labour market are more likely to become stay-at-home dads.

JEL Codes: F22, J22, O15

Keywords: maternal migration, labour supply, South Asia, Sri Lanka.

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1. Introduction

More and more people emigrate and remit money back home, many of them are women, and mothers, from developing countries (Cortes, 2013; United Nations, 2013). In the last two decades, the flow of international migration has increased by one half and remittances have doubled (Clemens and McKenzie, 2014; United Nations, 2013). In 2013, 232 million people (3.2% of the world's population) are migrants: Two in five of these migrants are from developing countries and one in two are women (United Nations, 2013). In 2013, developing countries receive US$ 414 billion remittances, which are larger than foreign aid or foreign direct investment in some of the countries (World Bank, 2013).

Some of the migrants are "split migrants"—migrants who emigrate without their family members' company (Antman, 2012).[1] Many of them are women, whose share among split-migrants has increased in the last two decades (Cortes, 2013). In Sri Lanka, for example, more than nine in ten migrant workers are split migrants, many of them are women and most of them go to the Middle East.

In this paper, we examine what happens to Sri Lankan men's labour supply when their wives emigrate to work and leave the husbands and children at home—the effects of maternal migration on the husbands' labour

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[1] Split migration happens not only in the traditional North-South and East-West corridors but also in the South-South (for example, from South Asia to the Middle East) and West-West (for example, within Europe) corridors (United Nations, 2013).

supply. Migration from Sri Lanka is interesting because Sri Lanka is a lower middle income country whose one in five of the working-age population, half of them women, emigrate to work (Wijayaweera, 2014; Sri Lanka Bureau of Foreign Employment, 2012). We examine mothers, not all women, because how mothers decide whether to migrate may differ from how women without children do. Wives usually take care of their children so when they migrate, the husbands may have to take over; couples without children do not need to worry about this child-care arrangement. Two-thirds of the migrant women from Sri Lanka are mothers so that one-third of all migrants are mothers (Sri Lanka Bureau of Foreign Employment, 2012). We examine what happens to the labour supply of these migrants' husbands in Sri Lanka when they go abroad to work.

Few papers look at the effects of female migration on their husband's labour supply, even fewer look at the effects of maternal migration. The literature on the effects of migration on spousal work choices focuses on the effect of male migration on the females left behind; other papers look at the effects of migration in non-spousal terms, for example, the effect of migration on women regardless of the women's relationship with the migrant. These papers find remittances decrease female labour supply (sometimes in favour of unpaid work) and change men's participation in the labour market from formal- to self-employment. (They also find that remittances affect female labour supply more strongly.) Early studies that do not identify the effects of migration by gender of the migrants or that of the person whose

labour market outcome is examined such as Kim (2007) and Rodriguez and Tiongson (2001) find remittances reduce the labour supply of household members in the home countries. Lokshin and Glinskaya (2009), Binzel and Assaad (2011), and Mendola and Carletto (2012), use a gendered approach and find remittances sent by male migrants reduce the labour supply of female household members in the home countries. Acosta (2006) and Amuedo-Dorantes and Pozo (2006), on the other hand, look at the effects of remittances on male labour supply (irrespective of the gender of, and relationship to, the migrants). While both studies do not find remittances affect male labour force participation, Amuedo-Dorantes and Pozo (2006) find that men are more likely to work in the informal sector; they move away from formal sector work and urban self-employment.

Because maternal migration is endogenous, we use three-stage least-squares instrumental variable estimations. We use exogenous changes in the number of children that a household has to generate exogenous changes in maternal migration. In the first stage, we use sibling-sex composition of a household, a measure of parental preferences for having both sons and daughters, as an instrumental variable for the household's number of children. In the second stage, we use the predicted values of the number of children from the first stage to get exogenous changes in maternal migration. In the third stage, we use the predicted values of maternal migration from the second stage to estimate the effects of the exogenous changes in maternal migration on the husbands' labour market outcomes. (As robustness checks,

we also use another instrumental variable in the second stage, whether the community where the household lives has foreign-employment agencies, agencies that help many Sri Lankans to emigrate to work.)

We find Sri Lankan's men reduce their labour supply when their wives emigrate to work. The husbands are four percentage points more likely to exit the labour market and eight percentage point more likely to become unemployed; they are also more likely to become homemakers, are less likely to moonlight, and have lower monthly salaries. However, among husbands that work, we do not find evidence that maternal migration affects the type of work that they do and the number of hours they work.

This paper contributes to the literature in three ways. One, we look at the effects of maternal migration on the husbands' labour outcomes, which complements the literature on the effects of migration or remittances on the labour supply of household members in the home countries. Two, we use instrumental-variable estimations to address the endogeneity of maternal migration. Three, we examine migrants from Sri Lanka where the number of female migrants is large and most of the female migrants are mothers, which means we are likely to have high statistical power to identify the effects of maternal migration on the husbands' labour supply if there are any.

We proceed as follows. Sections 2 explain the empirical strategy and section 3 describes the data. Section 4 discusses the results. Section 5 concludes.

2. Empirical Strategy

Because migration is endogenous, we use instrumental-variable techniques to estimate the effects of maternal migration on the husbands' labour supply.[2] We use sibling sex-compositions of children to generate exogenous changes in the number of children that households have, which we in turn use to generate exogenous changes in the labour supply of the mothers in foreign markets—maternal migration. (We borrow the instrumental variable from the literature on the relationship between fertility and female labour supply such as Angrist and Evans (1998), Cruces and Galiani (2007), Baez (2008), and Sarma and Parinduri (2014)) To the extent that sibling sex-compositions of children are exogenous, we can identify the effects of maternal migration on the husbands' labour supply by looking at the relationship between the exogenous changes in maternal migration (induced by sibling sex-composition of children) and the husbands' labour supply using three-stage least-square regressions.

Formally, in the first stage, we estimate

$$more\ than\ two\ children_{ijk} = \alpha_1 + \beta_1 same\ sex_{ijk} + X\gamma_1 + \zeta_j + \varepsilon_{1ijk} \quad (1)$$

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[2] Maternal migration is endogenous because of selection, simultaneity, or reverse-causality problems. Migrant- and non-migrant households are likely to differ across some unobservable characteristics. Women's decision to migrate and their husband's labour supply may be affected by third factors such as an illness of a child or the need to finance children's education. Some women may migrate because their husbands are unemployed.

where $more\ than\ two\ children_{ijk}$ is an indicator equals one if a household i who lives in district j and community k has two or more children and zero otherwise; s$ame\ sex$ is an instrumental variable equals one if the first two children of household i are both sons or both daughters and zero otherwise; X is a vector of individual- and household characteristics; ζ_j is district fixed-effects, which control for both observed- and unobserved time-invariant district-specific characteristics such as a district's labour market conditions or networks of migrants from the district in the past; and ε is the error terms.

The variable *same sex* is a good instrumental variable for the number of children because (1) it correlates with *more than two children* (relevance assumption), and (2) gender of children is, to a larger extant, determined by nature, which means *same sex* is likely to affects female labour supply only through the number of children (exclusion restriction). The marginal utility of having an additional child for parents with all sons or all daughters is higher than that for parents with both sons and daughters—the relevance assumption holds. Moreover, in Sri Lanka, unlike in India, Pakistan and Bangladesh, there is little or no son preference (Abeykoon, 1995; Arnold, 1992)—the exclusionary restriction is likely to hold.[3] Sri Lanka's mortality rates of girls (infant mortality, neonatal mortality, post-neonatal natal, and child mortality rates) are slightly lower than those of boys (Arnold, 1992; Abeykoon, 1995). The World Development Indicators also shows the sex ratio at birth, the male

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[3] Baez (2008), for example, argues that the gender of children may not be exogenous when sex-selective abortions are prevalent.

to female infant mortality rate, and the ratios of female to male school enrolment, both at primary and secondary schools, in Sri Lanka, are close to one—child mortality rates and secondary school enrolment rates actually favour girls (World Bank, 2014).

In the second stage, we estimate

$$maternal\ migration_{ijk} = \alpha_2 + \beta_2 more\ than\ \widehat{two\ children}_{ijk} + X'\gamma_2 + \zeta_j + \varepsilon_{2ijk} \quad (2)$$

where $maternal\ migration_{ijk}$ is the migratory status of the wives, an indicator equals one if a wive in household i is a migrant and zero otherwise, and $more\ than\ \widehat{two\ children}$ is the predicted values of $more\ than\ two\ children$ from the first stage regression, Equation (1). Because $more\ than\ \widehat{two\ children}$ captures exogenous changes in the number of children (induced by sibling sex-composition), β_2 is the effects of having more than two children on the wives' labour supply abroad, that is, $maternal\ migration$.

In the third stage, we estimate:

$$w_{ijk} = \alpha_3 + \beta_3 \widehat{maternal\ migration}_{ijk} + X'\gamma_3 + +\zeta_j + \varepsilon_{2ijk} \quad (3)$$

where $\widehat{maternal\ migration}$ is the predicted values of the migratory status of the wives from the second stage, Equation (2); and w_{ijk} is a measure of labour outcomes of a husband in household i such as whether he is out of the labour force, whether he is employed, or his monthly pay. Because

$\widehat{maternal\ migration}$ is exogenous migration status of the wives (induced by sibling sex-composition of children), β_3 is the causal effects of *maternal migration* on the husbands' labour outcomes.

3. Data

We use the Sri Lanka Integrated Survey 1999-2000, a representative survey of Sri Lankan population except for the Northern- and Eastern regions where the then ongoing civil war disrupted data collections. The survey includes 7,500 households and 35,181 individuals. We restrict the sample to households with at least two children below the age of 16 because of the nature of the instrumental variable, *more than two children*, that we use. We also exclude male migrant households so that we have only non-migrant households in the control group.

We define the treatment variable, *maternal migration*, the migratory status of the wives, as an indicator equals one if the wives emigrates abroad to work and zero otherwise.

In the basic specifications, we use *out of the labour force* and *employed* as measures of the husbands' labour supply. *Out of the labour force* is an indicator equals if the husbands are out of the labour force and zero otherwise; *employed* is an indicator equals one if the husbands are employed and zero otherwise. We also use seven other measures of labour supply: For those who do any work (including household chores), we use four measures

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of types of work: *formal* (an indicator of formal employment), *informal* (an indicator of informal employment), *self-employed* (an indicator of self-employment), and *homemaker* (an indicator of being househusbands); for those who work in the labour market, we use three other measures of labour supply: *more than one job* (an indicator of moonlighting), *work hours* (the number of monthly work hours), and *monthly pay* (monthly income in Sri Lankan Rupees, which includes basic pay, perks, bonuses, and allowances).[4]

To make the exclusionary restriction more likely to hold, and to increase the statistical power of the estimations, we include individual-, household- and community characteristics as control variables. They are the age and educational attainment of the husband and the wife, the number of adults in the household, the religion of the head of household, and availability of a secondary school in the community where the household lives—each enter the regressions as a set of dummy variables.

The summary statistics in Table 1 show migrant- and non-migrant households do not differ much. The averages of age and years of schooling of the migrants and the husbands in the two groups of households are similar.

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[4] Following Amuedo-Dorantes and Pozo (2006), we define formal-sector employment as paid work done under contracts with regular income streams. Informal sector employment is paid employment without contracts, often with irregular income streams. Homemakers do household work full time without pay, that is, stay at home and do household chores, do not work for pay in the labour market.

Migrant- and non-migrant households also have similar size. We do not see large differences in the proportions of migrant households by religion except for Hindus. Larger proportion of households in rural areas are migrant households and the communities where migrant households live are less likely to have secondary schools, but the differences are small.

We find migrant- and non-migrant households differ in some measures of labour outcomes, though not necessarily in the direction that we expect if maternal migration reduces the husbands' labour supply. The husbands in migrant households are less likely to be employed, work in the formal sector, do more than one jobs; they are more likely to be out of the labour force, self employed, and homemakers.

[Table 1 is about here]

4. Results

4.1. Basic results

Panel A of Table 2, which presents the first stage-regression, shows that the instrumental variable, *same sex*, predicts *more than two children* well. The estimates in Panel A, regardless of whether we control for household and community characteristics, suggest having both sons or both daughters as the first two children increases the likelihood of having more children by 7-9 percentage points, a large effect given that the average number of children of households in the sample is less than three. The instrumental variable is

strong—the F-statistics are larger than ten, which Staiger and Stock (1997)

suggest as the rule of thumb for a strong instrument; they are also within a

tolerable bias level of 15% based on Stock and Yogo's (2005) critical values.[5]

(Both estimates are statistically significant at 0.1% level; the adjusted R-

squareds are about 0.3-0.4.)

[Table 2 is about here]

Panel B of Table 2, which presents the second-stage regression, shows

that *more than two children* predicts *maternal migration* well. Having more

than two children (induced by *same sex*) increases the probability that the

wives migrate abroad to work by 7-8 percentage points. (The estimate in

column 1 without control variables is statistically significant at 1% level; that

in column 2 at 5% level; the F-statistics are large; the adjusted R-squareds are

about 0.3-0.4.)

Table 3, which presents the third-stage regressions, shows that

maternal migration reduces the husbands' labour supply: A husband is four

percentage points more likely to exit the labour market when his wife

migrates abroad to work; they are also eight percentage points less likely to

work. The 3SLS estimates are similar regardless of whether we control for

household- and community characteristics (columns 3-4). The ordinary least

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[5] In Table 2 of Stock and Yogo (2005), for the case of one endogenous variable with one instrumental variable, the critical values for the tolerance of bias of a weak instrument are 16.38, 8.96, 6.66, and 5.53 for 10%, 15%, 20%, and 25% tolerance of the bias, respectively.

squares (OLS) estimates (columns 1-2), are a bit smaller, though the OLS and 3SLS estimates may not statistically differ.

[Table 3 is about here]

Among husbands who do any work (including household chores), we find maternal migration makes them more likely to become homemakers, but we do not find evidence that it affects the likelihood that they work in the formal or informal sector or self-employment (Panel A of Table 4). (We present only the 3SLS estimates for brevity.) Maternal migration make the husbands 3-4 percentage points more likely to become homemakers and eight percentage points less likely to work in the formal sector, though the estimates of the latter are statistically insignificant. The estimates of the effects on working in the informal sector and self-employment are statistically insignificant with standard errors that are bigger than the estimates.

We also find maternal migration reduces the wages of the husbands and the likelihood that they do more than one jobs (Panel B of Table 4). Maternal migration makes the husbands ten percentage point less likely to do more than one job and reduces monthly pay by 25 percent (column 2). Maternal migration seems to reduce monthly working hours too, but the estimates are statistically insignificant.

[Table 4 is about here]

Maternal migration reduces the husband's labour supply. The husbands were more likely to exit the labour market and, if they remain in the

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labour market, are less likely to work. Among those who do any work, the husbands are more likely to become homemakers and less likely to do more than one job. There is also some evidence that they have lower monthly wages.

4.2. Using an additional instrumental variable

As robustness checks, we also use the presence of foreign-employment agencies in the past in the community where a household lives as an additional instrumental variable for maternal migration. We match the addresses of foreign-employment agencies in 1995, which we obtain from Sri Lanka's Association of Licensed Foreign Employment Agents, with the communities where the households in the sample live in 2000. We define the instrumental variable equals one if there were foreign-employment agencies in a community in 1995 and zero otherwise.

The presence of foreign-employment agencies in the past predicts maternal migration because the agencies help migrants to find jobs abroad, mediate them with prospective employers, prepare contracts on behalf of the migrants, and arrange the necessary travel documents—services that many Sri Lankan female migrant workers use. According to Sri Lanka Bureau of Foreign Employment (2011), three in four Sri Lankan female migrants in the past fifteen years have used the agencies' services. Sarma and Parinduri (2014) and Gamburd (2000) also show that the presence of foreign-employment agencies increases the likelihood of parental migration. In this

paper, we use the same variable as an additional instrumental variable for maternal migration. The variable *agencies* is similar to migration networks that past studies such as Munshi (2003), Hanson and Woodruff (2003), and McKenzie and Rapoport (2007) use to instrument for migration.

We estimate similar 3SLS regressions; the only difference is we use an additional instrumental variable in the second-stage regression. In the first stage, we estimate Equation (1). In the second stage, we estimate

$$maternal\ migration_{ijk} = \alpha_2 + \beta_2 \widehat{more\ than\ two\ children}_{ijk} + \delta agencies_{jk} + X'\gamma_2 + \zeta_j + \varepsilon_{2ijk} \tag{4}$$

where *agencies* is an indicator for the presence of foreign-employment agencies. Then, in the third stage, we estimate Equation (3).

While *agencies* does predict maternal migration (the instrument is relevant) and we cannot test whether *agencies* affects the husbands' labour supply only through maternal migration (the exclusion restriction), we do not find communities with- and those without foreign-employment agencies systematically differ in 1995, at least along the household- and community characteristics whose data are available (Appendix A). There is no evidence that foreign-employment agencies are more likely to operate in less developed communities or that many household in Sri Lanka internally migrate to communities with foreign-employment agencies to work abroad (Panel A shows both types of communities have had schools and health facilities for 50 and 31 years, respectively; only one in fifty households have

migrated within Sri Lanka since 1995—the figures are the same in both communities with and without foreign-employment agencies). Communities with and without foreign-employment agencies do not seem to systematically differ either as their characteristics in 2000 indicate (Panel B shows communities with foreign-employment agencies are more likely to have schools in 2000, but they are less likely to have health facilities, banks, or markets; more importantly, the differences do not differ statistically). Even the characteristics of the households (Panel C) and those of the work choices (Panel D) in 2000 do not statistically differ.

Table 5, which presents the second-stage estimates, shows that *agencies* predicts *maternal migration* well—the instrumental variable is relevant. The second stage estimates of a three-stage least square regression (in which we use *same sex* as an instrumental variable for *more than two children* in the first stage) show living in a community with foreign-employment agencies increases the likelihood of maternal migration by 14 percentage points (columns 2-3). The estimates are statistically significant at 0.1% level and the F-statistics of the regressions are bigger than 10. (The estimates of the coefficients of *more than two children* are identical to those in Panel B of Table 2.)

[Table 5 is about here]

The third-stage estimates—the magnitude, sign, and statistical significance—are similar to those in Tables 3-4: Husbands of migrant wives are four percentage points more likely to exit the labour market, nine

percentage points more likely to be unemployed, four percentage points more likely to be homemakers; and eleven percentage points more likely to do more than one jobs; they are also likely to have 28% lower monthly salaries. The effects on other measures of labour supply are similar to those in Table 4, both the sign and the magnitude, but they are statistically insignificant (we do not present these estimates for brevity.)

[Table 6 is about here]

4.3. The effects of maternal migration by urban or rural area

We do not find evidence that the effects of maternal migration on husbands in urban and rural areas differ (Table 7). The signs and magnitude of estimates in urban and rural areas are similar; they are also similar to the estimates in Tables 3-4. Some estimates become less significant statistically or marginally significant at 10% level, but that is perhaps because the sample size is smaller. We should, however, cautiously interpret these estimates because we do multiple comparisons; some estimates are statistically insignificant after we use the Bonferroni correction.

[Table 7 is about here]

6. Conclusion

When Sri Lankan married women with children, emigrate to work, their husbands reduce their labour supply, results that seem to apply for husbands who live in urban and rural areas. The husbands are four percentage-points

more likely to exit the labour market and eight percentage points more likely to become unemployed. The employed are ten percentage-points less likely to moonlight and have about 25 percent lower monthly salary on average; among those that exit the labour market, many of them become stay-at-home dads. However, we do not find maternal migration affects the sector in which the husbands work, whether the husbands work in the formal sector, informal sector, or self-employed.

These findings differ from those in the literature perhaps because we examine the effects of maternal migration on the husbands' labour supply, not just the effects of the migration of some members of households on other members of households in the home country. Amuedo-Dorantes and Pozo (2006) and Acosta (2006), for example, do not find remittances affect the labour market participation of males in the home countries, but they do not take into account the relationship between the migrants and the people whose labour supply they examine. Amuedo-Dorantes and Pozo (2006) find migration induces members of households in the home country to move from the formal to the informal sector, which again differ from our findings. (Amuedo-Dorantes and Pozo (2006) and Acosta (2006) examine the cases of Mexico and El Salvador whose flows migration is dominated by male migration; their results, therefore, are not the effects of maternal migration on the husbands' labour supply.)

Our findings that the effects of maternal migration on husbands in urban and rural areas are similar also differ from, for example, Amuedo-

Dorantes and Pozo's (2006) and Binzel and Assad's (2011). Amuedo-

Dorantes and Pozo (2006) find only women in rural areas were less likely to

work in the labour market if the household receives remittance; they also find

self-employment is likely to decrease only for males in urban areas. Binzel

and Assad (2011) find women in rural areas whose husband is a migrant are

more likely to do unpaid and subsistence work.

We suggest two explanations of the adverse effects of maternal

migration on the husbands' labour supply: reservation wage and childcare.

Remittances that the husbands receive from their wives increase the

reservation wages of the husbands, which leads them to substitute work with

leisure (Killingsworth, 1983); the husbands, therefore, lower their labour

market participation and do less moonlighting. Gamburd (2004) also finds the

absence of the wives at home makes the husbands more likely to be

alcoholic, which may cause them to lose jobs. (We also find husbands of

migrant women increase spending on alcohol by 122% on average in the data

that we use.) Two, the absence of the wives at home increases the opportunity

cost of working because somebody has to take care of the children and do

household chores, which makes the husbands more likely to leave the labour

market and become homemakers.

Even though our results are the effects of maternal migration induced

by whether the first two children of a household are both sons or both

daughters, we think our results are quite general. One, many households in

Sri Lanka want both sons and daughters, which is also true in other

developing countries. Two, our results are robust when we use another instrumental variable, whether a community has a foreign-employment agencies as an additional instrumental variable. Three, our results are also robust by urban or rural area. Our results, therefore, may apply for countries whose stage of development is like Sri Lanka's in the early 2000s.

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Table 1 Descriptive statistics

	Female migrant household	Non migrant household
	(1)	(2)
A. Outcomes		
Out of labour force (1 if out of the labour force)	0.10	0.14
	(0.30)	(0.41)
Employed (1 if working)	0.88	0.91
	(0.28)	(0.41)
Formal (1 if employed in the formal sector)	0.15	0.32
	(0.36)	(0.47)
Informal (1 if employed in the informal sector)	0.39	0.30
	(0.49)	(0.46)
Self (1 if self-employed including farming)	0.42	0.38
	(0.50)	(0.49)
Homemaker (1 if attending to household chores)	0.04	0.01
	(0.20)	(0.08)
More than one job (1 if more than one job)	0.03	0.08
	(0.17)	(0.27)
Hours (monthly average)	141.52	161.81
	(113.87)	(119.22)
Monthly pay (in LKR 2000 rates)	8,234.93	11,683.46
	(9,286.24)	(15,193.47)
B. Characteristics		
Age	41.60	44.27
	(7.14)	(8.14)
Years of schooling	6.61	7.87
	(3.29)	(3.29)
Spouse's age	37.78	37.14
	(7.97)	(8.94)
Spouse's years of schooling	7.66	8.65
	(2.74)	(3.12)

	Female migrant household	Non migrant household
	(1)	(2)
Number of children in household	2.62	2.74
	(1.07)	(1.10)
Number of adults in household	2.32	2.20
	(2.59)	(2.22)
Buddhist	0.72	0.62
	(0.24)	(0.31)
Hindu	0.09	0.18
	(0.29)	(0.39)
Muslim	0.11	0.10
	(0.32)	(0.31)
Christian	0.07	0.07
	(0.25)	(0.26)
Rural	0.85	0.78
	(0.33)	(0.39)
Secondary school (1 if available in community)	0.39	0.42
	(0.49)	(0.49)

Notes: Numbers in parentheses are standard deviations. The number of observations for *out of labour force is* 151 for female migrant households and 4,172 for non migrant households. For the rest of the variables, the number of observations is 132 and 3,629 respectively for female migrant households and non migrant households.

Table 2 First- and second-stage estimates using fertility as instrument

	(1)	(2)
Panel A: First-stage		
Dependent variable: *more than two children*	0.086***	0.072***
Independent variable: *same-sex*	(0.010)	(0.011)
F-Statistic	24.18	14.26
Adjusted-R^2	0.316	0.389
Panel B: Second-stage		
Dependent variable: *migrant wife*	0.076**	0.069*
Independent variable: *more than two children*	(0.027)	(0.027)
F-Statistic	19.13	22.78
Adjusted-R^2	0.261	0.371
Control variables		✓
Observations	3,761	3,761

Note: Each cell in Panel A is the estimate of *more than two children* on *same-sex*, district fixed-effects and other covariates. Each cell in Panel B is the estimate of *Migrant wife* on *more than two children*, using *same-sex* as an instrument, district fixed-effects and other covariates. Other covariates include dummies for the age and educational attainment of the individual and his spouse, the number of adults in the household, dummies for religion and availability of a secondary school in the community. *Same-sex* equals one if the first two children are boys or girls; *more than two children* equals one if the individual has three or more children; m*igrant wife* equals one if the spouse of the individual migrated abroad for work. The sample includes married men with two or more children. Robust standard errors are in parentheses; the signs ***, **, * indicate statistical significance at the 0.1%, 1% and 5% levels respectively.

Table 3 Third stage estimates of any work

| | OLS | | 3SLS | |
	(1)	(2)	(3)	(4)
Dependant variable: *Out of labour force*				
Migrant wife	-0.034*	-0.031*	-0.038*	-0.035*
	(0.016)	(0.015)	(0.017)	(0.017)
Observations	4,323	4,323	4,323	4,323
Adjusted-R^2	0.193	0.228	0.274	0.281
Dependant variable: *Employed*				
Migrant wife	-0.072*	-0.060*	-0.079*	-0.078*
	(0.032)	(0.031)	(0.040)	(0.040)
Observations	3,761	3,761	3,761	3,761
Adjusted-R^2	0.177	0.212	0.286	0.304
Control variables		✓		✓

Note: Each cell is the estimate of *out of labour force* on migrant wife in panel A and, estimate of *Employed* on *migrant wife* in panel B, using *more than two children* as the instrument, district fixed-effects and other covariates—dummies for the age and educational attainment of the individual and his spouse, the number of adults in the household, dummies for religion and availability of a secondary school in the community. *Out of labour force* equals one if the individual is not working nor actively looking for work; *Employed* equals one if the individual engaged in formal-, informal-, self- employment; *Migrant wife* equals one if the spouse of the individual migrated abroad for work. The sample includes all married men with two or more children in Panel A, and only those who are working or actively looking for work in Panel B. Robust standard errors are in parentheses; the sign * indicates statistical significance at the 5% level.

Table 4 3SLS estimates of other types of work and work attributes

Dependent variable		(1)	(2)
Panel A: Type of work			
Formal	(1)	-0.084	-0.081
		(0.053)	(0.051)
Informal	(2)	0.021	0.016
		(0.068)	(0.061)
Self	(3)	0.026	0.022
		(0.065)	(0.061)
Homemaker	(4)	0.041***	0.032***
		(0.007)	(0.006)
Observations		3,559	3,559
Panel B: Work attributes			
More than one job	(5)	-0.114**	-0.099**
		(0.040)	(0.038)
Hours	(6)	-7.874	-6.153
		(8.567)	(7.994)
Log monthly pay	(7)	-0.274*	-0.251*
		(0.112)	(0.104)
Control variables			✓
Observations		3,474	3,474

Note: Each row identifies the estimation of the dependent variable listed in the column to the left on *migrant wife*, using *more than two children* as the instrument, district fixed effects and other covariates—age and educational attainment of the individual and his spouse, the number of adults in the household, religion and availability of a secondary school in the community. The sample for Panel A includes those who are *homemakers* (househusbands); because work attributes are not available for this activity, we exclude *homemakers* from the sample in Panel B. Robust standard errors are in parentheses; the signs ***, **, * indicate statistical significance at the 0.1%, 1% and 5% levels respectively.

Table 5 First and second stage estimates of agencies and more than two children on maternal migration

Dependent variable: Migrant wife	Second-stage	
	(1)	(2)
Agencies	0.141***	0.138***
	(0.012)	(0.012)
More than two children	0.071**	0.068*
	(0.027)	(0.027)
Control variables		✓
Observations	3,761	3,761
Cragg-Donald Wald F-stat	25.48	23.64
Adjusted-R^2	0.381	0.403

Note: Each cell is the estimate of *Migrant wife* on *more than two children*, using *same-sex* as an instrument, district fixed-effects and other covariates—dummies for the age and educational attainment of the individual and his spouse, the number of adults in the household, dummies for religion and availability of a secondary school in the community. *Migrant wife* equals one if the spouse of the individual migrated abroad for work; *More than two children* equals one if the individual has three or more children. The sample includes married men with two or more children. Robust standard errors are in parentheses; the signs ***, **, * indicate statistical significance at the 0.1%, 1% and 5% levels respectively.

Table 6 3SLS estimates of spousal labour outcomes using two instruments

Dependant variable:	Out of labour force	Employed	Homemaker	More than one job	Log monthly pay
	(1)	(2)	(3)	(4)	(5)
Migrant wife	-0.041*	-0.088*	0.040***	-0.107**	-0.284**
	(0.019)	(0.042)	(0.006)	(0.039)	(0.112)
Observations	4,323	3,761	3,559	3,474	3,474
Adjusted-R^2	0.318	0.321	0.404	0.156	0.429

Note: Each cell is the estimate of the type of work listed on top of each column (1-5) on *migrant wife*, using *more than two children* and *agencies* as instruments, district fixed-effects and other covariates—dummies for the age and educational attainment of the individual and his spouse, the number of adults in the household, dummies for religion and availability of a secondary school in the community. *Migrant wife* equals one if the spouse of the individual migrated abroad for work. The sample used in Column 1 estimates includes all married men with two or more children, that in Column 2 excludes those are not working or actively looking for work, that in Column 3 includes all working individuals and homemakers, those in Columns 4 and 5 only include working individuals. Robust standard errors are in parentheses; the signs ***, ** and * indicate statistical significance at the 0.1%, 1% and 5% levels, respectively.

Table 7 3SLS estimates for urban and rural samples

Dependent variable		Rural	Urban
		(1)	(2)
Out of labour force	(1)	-0.034	-0.039*
		(0.018)	(0.017)
Employed	(2)	-0.089*	-0.069
		(0.042)	(0.037)
Formal	(3)	-0.085	-0.098*
		(0.053)	(0.045)
Informal	(4)	0.020	0.017
		(0.069)	(0.061)
Self	(5)	0.027	0.036
		(0.066)	(0.069)
Homemaker	(6)	0.044***	0.033***
		(0.007)	(0.008)
More than one job	(7)	-0.107**	-0.090*
		(0.037)	(0.036)
Hours	(8)	-7.689	-7.537
		(9.651)	(9.432)
Log monthly pay	(9)	-0.284**	-0.302**
		(0.099)	(0.101)
Log hourly pay	(10)	-0.171	-0.165
		(0.117)	(0.115)

Note: Each row identifies the estimation of the dependent variable listed in the column to the left on *migrant wife*, using *more than two children* and *agencies* as instruments, district fixed effects and other covariates—age and educational attainment of the individual and his spouse, the number of adults in the household, religion and availability of a secondary school in the community. Robust standard errors are in parentheses; the signs ***, ** and * indicate statistical significance at the 0.1%, 1% and 5% levels, respectively.

Appendix B: Descriptive statistics by type of community

	Agencies=1	Agencies=0
	(1)	(2)

A. Access to facilities and migration in the past

Community are better off compared to ten years ago	0.83	0.86
	(0.40)	(0.37)
Years of operation of oldest school in community	51.60	49.26
	(40.57)	(35.14)
Years of operation of oldest health facility in community	30.85	30.74
	(26.85)	(26.85)
Migrated internally since 1995	0.02	0.02
	(0.14)	(0.13)

B. Current access to facilities

Primary schools	0.58	0.54
	(0.49)	(0.50)
Secondary schools	0.44	0.40
	(0.50)	(0.49)
Health centers	0.42	0.43
	(0.49)	(0.50)
Public health care facilities	0.15	0.20
	(0.36)	(0.40)
Private health care facilities	0.32	0.33
	(0.47)	(0.47)
Main roads	0.68	0.68
	(0.47)	(0.47)
Post offices	0.38	0.42
	(0.48)	(0.50)
Banks	0.25	0.28
	(0.43)	(0.45)
Markets	0.20	0.23
	(0.40)	(0.43)
Bus stops	0.29	0.31
	(0.45)	(0.49)
Local administrative offices	0.93	0.94
	(0.26)	(0.24)

C. Individual, Spousal- and household characteristics

Age	42.38	43.46
	(7.42)	(7.48)

	Agencies=1	Agencies=0
	(1)	(2)
Years of schooling	6.92	7.46
	(3.38)	(3. 40)
Spouse's age	37.24	37.60
	(7.66)	(7.86)
Spouse's years of schooling	8.08	8.16
	(2.98)	(3.04)
Number of children in household	2.66	2.68
	(1.09)	(1.09)
Number of adults in household	2.26	2.24
	(2.52)	(2.46)
Buddhist	0.62	0.64
	(0.34)	(0.34)
Hindu	0.18	0.18
	(0.36)	(0.42)
Muslim	0.14	0.10
	(0.36)	(0.37)
Christian	0.10	0.11
	(0.25)	(0.27)

D. Work Characteristics

	Agencies=1	Agencies=0
Any work	0.91	0.92
	(0.36)	(0.39)
Formal	0.26	0.29
	(0.38)	(0.43)
Informal	0.34	0.32
	(0.48)	(0.47)
Self	0.39	0.38
	(0.49)	(0.47)
Homemaker	0.01	0.01
	(0.11)	(0.09)
More than one job	0.06	0.07
	(0.24)	(0.26)
Hours	143.64	154.37
	(103.88)	(101.34)
Monthly pay	9,148.64	9,652.22
	(14,454.85)	(14,671.37)
Hourly pay	63.69	62.53
	(139.15)	(144.77)

Notes: Numbers in parentheses are standard deviations. The numbers of observations for columns 1-2 are 1,106 and 2,655, respectively.