FERTILITY AND WOMEN'S LABOR FORCE PARTICIPATION IN DEVELOPING COUNTRIES*

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Abstract. To estimate the causal impact of fertility on women's labor force participation, we use the occurrence of multiple first births and the sex of the first births as measures of exogenous shocks to fertility. Since twins at first birth occur relatively rarely in one country, we use all available Demographic and Health Surveys. We find that preference for children of multiple sexes and sons are predominant factors in determining how women adjust their fertility decisions to the outcome of their first two births. Decisions regarding fertility and labor vary considerably depending on a woman's age and geographic location. Variation in infant mortality also plays a role, as effects are often quite different on total fertility from the effects on the number of surviving children. Throughout the developing world, women have more children if they had twins in the first birth or if the first two births were the same sex. Son preference predominates in South Asia, where women have fewer children if either or both of their first two children born were sons. While many women in developing countries are similar to women in the U.S. in that they are less likely to participate in the labor force as a result of having more children, in a number of cases the opposite seems to be the case. We provide a number of possible explanations for why we might see such differences: tight budget constraints, high infant and child mortality rates, the ability to work from home, improved bargaining power, and the substitution of daughters' time for that of mothers in household production.

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INTRODUCTION

Previous studies in the U.S. (e.g., Angrist and Evans 1998; Rosenzweig and Wolpin 1980a; 2000) have found that exogenous shocks which raise women's fertility lead them to work less. In this study we examine whether these results can be generalized to the developing world.

Women in developing countries face a number of trade-offs in their joint decision regarding fertility and work. A woman's capacity to perform physical labor is diminished during the period surrounding childbirth. The need to care for a child restricts the time that a mother can devote to paid labor, inside or outside the home. For example, a study of urban households in India concluded that the presence of children increases mothers' time in home production, with the effect of younger children (aged 0-6 years) being six times the effect of older children (Malathy 1994). But the need to provide care diminishes as the child grows, permitting the mother to return to work (alternately, the utility of working exceeds the utility of remaining at home).

On the other hand, a mother's decision to work is also influenced by the fact that the household needs additional resources to provide for additional children. This is particularly the case when children are too young to either contribute to household income or to substitute for the mother's time spent in household production. Women in developing countries are more likely to face such trade-offs because of budget constraints resulting from lack of resources, opportunities, and other poverty-related challenges.

What motivates families to have fewer children? In poor societies, with high mortality, having many children provides both income and insurance. Children provide labor for current consumption and a means of support in old age. As mortality declines and markets for both human and financial capital develop, fewer children are required to obtain these benefits for the household. Also, as families – and especially women – develop their human capital, and as demand for skilled labor increases with development, wages rise and so does the opportunity cost of time, including the time required to raise children. Fertility falls as women's education and independence increase. This suggests that the primary determinant of fertility change is change in desired family size – that is, the demand side.

Thus, when examining the effects of fertility on women's labor market behavior, one must address the simultaneous endogeneity of women's fertility and employment decisions. Engelhardt, Kögel and Prskawetz (2004) find significant causality in both directions using European data; and Kögel (2003) finds that the negative correlation between fertility and employment has become significantly smaller (though not positive) in Europe since the mid-1980s. On the other hand, McNown and Rajbhandary (2001), using cointegration methods, find that female labor force participation responds significantly to fertility shocks, but the effects from work to fertility are insignificant.

Carrasco (2001) applies a binary switching model to the U.S. Panel Study on Income Dynamics, accounting for both endogeneity and unobserved heterogeneity, using sex composition as an instrument for changes in fertility. Carrasco also finds a larger impact in the IV; on the other hand, the failure to account for unobserved heterogeneity biases the estimate upwards.

Using Markov chain Monte Carlo (MCMC) methods, Troske and Voicu (2004) find that children have a strong effect on women's labor market behavior, and that differences in expected (future) fertility also have a strong effect on labor market behavior prior to the birth. They also find that the effects are largest immediately after the birth, but decline over time.

Korenman and Neumark (1992) proposed a method to study the effects of marriage and fertility on women's wages in the U.S. that is supposed to eliminate possible bias related to unobserved fixed variables that affect wages, fertility, and marriage by focusing on *changes* in the labor and fertility outcomes.

Rosenzweig and Wolpin (1980a, 2000), use cross-sectional data and the occurrence of twins in the first pregnancy to look at the impact of fertility on labor force participation, and show significant negative effects of additional children on mother's labor force participation. Using a two-stage estimation strategy, Angrist and Evans (1998) first estimate the probability of childbearing as a function of the sex of the first two children. With a sample of women ages 21 to 35 with at least two children, they also find that additional children reduce women's labor supply, and the poor and less educated are more severely affected. Hotz and others (2004) exploit the occurrence of spontaneous abortion (miscarriage) as the instrument for childbearing.

While there has been a great deal of study on this issue in the U.S. and Europe, there has been very little study in developing countries. One exception is a study by Chun and Oh (2002), which instrumented fertility decisions in Korea with the sex of the first child. The authors find that having an additional child reduces labor force participation by almost 40%, on average; but there is considerable heterogeneity across families.

In this paper, we adopt similar strategies to those employed by Rosenzweig and Wolpin (1980a, 2000) as well as Angrist and Evans (1998). We use a set of household survey data from 59 developing countries (96 Demographic and Health Surveys (DHS)) to estimate the relationship between women's labor market behaviors and fertility.[1] We are able to take advantage of the availability of similar information across these countries (a number of which

[1] Additional DHS were not included because data on labor force participation was not available.

were surveyed several times) to obtain a large enough sample of women of childbearing age who had a multiple birth in their first birth.

What Factors are Unique to Women in Developing Countries?

For women in developing countries, joint decisions regarding fertility and labor force participation differ considerably from those living in industrialized countries. Mortality rates for infants and children under five continue to be higher in many developing countries. Rates for all countries and regions in the sample are in Table A1 of the Appendix. Because of these high mortality rates, the number of children born differs somewhat from the number of surviving children. The correlation in our sample is 0.92. Since labor force participation is observed for 12 months prior to the survey, women's decisions may be more greatly influenced by the number of surviving children rather than their total number of births. In addition, women in developing countries will tend to have more births in part because their children are less likely to survive past the age of five.

It is also important to distinguish between differences in male and female mortality rates, particularly when examining the effects of the sex of first births. In most developing countries, male mortality rates are considerably higher than female mortality rates. For example, in Latin America and the Caribbean, male infant mortality rates are 30% higher, and in sub-Saharan Africa, they are 13% higher (see Table A1 in the Appendix). Women in developing countries may have more children born if their first two were sons because sons are less likely to survive than daughters. On the other hand, they may have fewer surviving children when their first are sons because of these survival differences.

Out of all the countries in our sample, female mortality rates are higher in three of them: India, Nepal, and Pakistan.[2] In much of South Asia, son preference dominates. Indeed, Filmer et al. (2008) used the DHS and found strong evidence of son preference in South Asia, Eastern Europe and Central Asia, particularly when fertility levels are low and women are relatively more educated. In these countries, women whose first born was a daughter have more subsequent children because they are interested in having at least one son. Thus, as Filmer et al. (2008) point out, girls tend to have considerably more siblings.

Daughters often provide child care to their younger siblings, particularly because women in developing countries have fewer formal child care options than do women in wealthier countries. Prior studies have found that the cost and availability of such services are important factors in determining whether women participate in the labor force and whether their daughters attend school. For example, Lokshin et al. (2000) found that higher child care costs in Kenya negatively impact mothers' participation in market work and reduce the number of girls in school. Lokshin (2000) and Fong and Lokshin (2000) also found that child-care costs in Russia and Romania have a significant impact on mothers' labor force participation and labor supply decisions. Finally, Chase (1995) found that in the Czech Republic and Slovakia, the fall of communism precipitated lower labor force participation rates of young married women with small children because of higher costs of formal childcare.

In many countries in sub-Saharan Africa and Latin America, child fostering is common, and children often do not live with their birth mothers for significant periods of time. For example, children in Liberia spend nearly 30% of their childhood apart from their mothers; in Mali it is 12%; in Kenya it is 7%; and in Latin America children spend about 4 to 6% of their childhood away from their mothers. One exception is the Dominican Republic, where they spend

[2] China was not included in the sample.

13% of their childhood apart from their mothers. Children are often sent to live with other relatives to reduce the household's financial burden. But many older children are also sent away so that they can experience better educational or social opportunities (Lloyd and Desai 1992). For example, Zimmerman (2002) found that Black South African children who were sent away to live where school enrollment was easier were 22% less likely to be at risk of not attending school.

In addition to child fostering, costly or few formal childcare options, and high infant and child mortality rates, women in developing countries commonly work in agrarian and informal sectors. The DHS target poor rural women across the developing world, many of whom work in agriculture and are self-employed. Of those who are working at the time of being surveyed,[3] 43% are employed in the agriculture sector. We find this population's labor force participation decisions are often affected quite differently from those in industrialized countries by multiple births and the sex composition of first births. While many women in developing countries are similar to women in the U.S. in that they are less likely to participate in the labor force as a result of having more children, in a number of cases the opposite seems to be the case. We provide a number of possible explanations for why we might see such differences: tight budget constraints, high infant and child mortality rates, the ability to work from home, improved bargaining power, and the substitution of daughters' time for that of mothers in household production.

DATA AND EMPIRICAL STRATEGY

The Demographic and Health Surveys are nationally representative and have been widely used in studying developing countries both individually and in comparative studies. In our analysis, we use all 96 publicly accessible DHS datasets available for 59 different countries (see Table A4 in the Appendix for a complete list).

[3] 54% of the women surveyed have worked in the past 12 months.

Following Rosenzweig and Wolpin (1980a, 2000), we divide the population into three age groups representing three different stages in a woman's life-cycle. The average age at first birth is around 19. Table A2 in the Appendix points out that fertility rates vary considerable across age groups in all of the regions and countries in the sample. In Latin America and the Caribbean, and in higher-fertility countries in sub-Saharan Africa and South Asia, fertility rates peak for women ages 20 to 24. For lower-fertility countries in sub-Saharan Africa and South Asia, fertility rates peak when women are ages 25 to 29. Pakistan is one exception where fertility rates are high, but peak at ages 25 to 29. In all, we see that fecundity declines significantly with age, particularly after age 35. In addition, as women get older, they generally gain more experience and see incomes rise. For these reasons, women at different stages of the life cycle will be differentially influenced by exogenous shocks to their fertility. This is particularly important since we only observe labor force participation in the past 12 months. Younger women are having more child births and have younger children that need their care at home. Older women have higher wages and therefore higher opportunity costs of time. They also have older children who can provide additional sources of income or who can substitute for their mother's time in household production. For these reasons, fertility shocks will affect women differently depending on their ages. Younger women may be less likely to participate in the labor force, while older women may be more likely to do so, particularly when women have an additional child.

As previously mentioned, we adopt the approaches used by Rosenzweig and Wolpin (1980a, 2000) and Angrist and Evans (1998) in their analyses of the U.S. To estimate the causal impact of fertility on women's labor supply, we use the occurrence of twins and the sex in first births as measures of exogenous shocks to fertility. A multiple birth in the first birth is used as opposed to any multiple birth during a woman's lifetime, because women who have a greater preference or demand for more children are also more likely to have a multiple birth. In addition to examining the effects of a twin in the first birth, we also examine whether the sex of the twins matters.

Labor force participation is defined as having worked in the past twelve months. This dependent variable presents a number of limitations, as fertility is observed over the course of a woman's lifetime, but labor is only observed in the past year. As a result, it is unfortunately not possible to study much of the dynamics involved in the decision made by women over time. However, we can compare women across different cohorts whose labor supply decisions are observed at different stages of the life cycle.

In the following section, we discuss the results of our estimation of the following regressions:

$$Y_{ijt} = \beta_0 + \beta_1 Twin_{ijt} + \beta_3 A_{ijt} + \beta_4 U_{ijt} + \mu_j + \eta_t + \varepsilon_{ijt} \quad (1)$$

$$Y_{ijt} = \beta_0 + \beta_1 Twin\ Girl_{ijt} + \beta_2 Twin\ Boys_{ijt} + \beta_3 Twin\ Boy/Girl_{ijt} + \beta_4 A_{ijt} + \mu_j + \eta_t + \varepsilon_{ijt} \quad (2)$$

$$Y_{ijt} = \beta_0 + \beta_1 Same\ Sex_{ijt} + \beta_2 First\ is\ Boy_{ijt} + \beta_3 Second\ is\ Boy_{ijt} + \beta_4 A_{ijt} + \mu_j + \eta_t + \varepsilon_{ijt} \quad (3)$$

$$Y_{ijt} = \beta_0 + \beta_1 1^{st}\ is\ Boy_{ijt} + \beta_2 1^{st}\ Two\ Boys_{ijt} + \beta_3 1^{st}\ Two\ Girls_{ijt} + \beta_4 A_{ijt} + \mu_j + \eta_t + \varepsilon_{ijt} \quad (4)$$

where Y_{ijt} is the outcome variable (number of children ever born, number of surviving children, and a dichotomous variable equal to one if respondent *i* worked in the past twelve months and zero otherwise); A_{ijt} represents the covariates specific to respondent *i* (age at first birth and age at last birth); and μ_j and η_t are the country and survey year fixed effects. We estimate effects on fertility using ordinary least-squares regressions, and the labor supply decisions are estimated by logit regressions. Regressions (1) and (2) are estimated for all women who have given birth to at least *one* child, whereas regressions (3) and (4) are estimated for all women who have given birth to at least *two* children. Regressions are estimated separately for rural and urban women, as well as for women of different age groups.

RESULTS

1. The Impact of a Multiple First Birth

We begin by examining results from regression (1). Each coefficient in Table 1 is the coefficient on the dummy variable for having a multiple birth in the first birth. This variable has a consistently positive impact on women's fertility, across all regions, urban and rural areas, and ages. With the exception of East Asia, the impact on the total number of children is slightly higher for women in rural areas. However, the impact on the number of surviving children is always lower in rural than in urban areas, a reflection of higher infant and child mortality rates in rural areas. The difference between the impact of a multiple first birth on the number of children born and the number of surviving children is greatest for rural sub-Saharan Africa and South Asia, where mortality rates are highest. In addition, the effect of a multiple first birth declines consistently with age across all regions in both urban and rural areas. In fact, in rural South Asia, the impact of a multiple first birth on the number of surviving children effectively drops to zero for women over 35.

These different effects across regions and ages point out the importance of distinguishing between these different groups. We see even greater differences in the impact of a multiple first birth on labor force participation rates. Overall, participation rates for urban women are negatively impacted by having an additional unexpected child. This is similar to findings in industrialized countries such as the U.S. However, in rural areas, the likelihood of women's labor force participation increases with an unexpected additional child. These overall effects are largely driven by the impact on women ages 25 to 34 (column 11). For urban women, coefficient estimates are statistically significant only for women ages 25 to 34 in Latin America and the Caribbean. For these women, having a multiple first birth reduces the likelihood of labor force participation by 22%. We see a similar impact for urban women in South Asia who are under 35 years of age, as well as urban women in East Asia who are over 35 years of age. The likelihood that these women have participated in the labor force in the past 12 months is reduced by 18 to 21% as a result of the unexpected child. Among rural women, only South Asian women under the age of 25 are less likely to participate in the labor force, and they are 28% less likely to if the first birth is a multiple birth.

In contrast, for many rural women, an unexpected additional child raises the likelihood that women have participated in the labor force in the past 12 months. East Asian rural women under the age of 35, South Asian women 25 and over, and women 35 and older from sub-Saharan Africa are all more likely to participate in the labor force if their first birth was a multiple one. The impact ranges from 18% for South Asian women ages 25 to 34 to 54% for East Asian women ages 25 to 34. In general, results are more mixed for rural than for urban women. This is likely to be due to the fact that many rural women often work from home while caring for children, and face tighter budget constraints when they have additional children.

2. The Impact of the Sex of the Multiple First Birth

Table 2 summarizes estimation results from regression (2), where the main regressors are dummy variables for the sex of the first multiple birth. The omitted category here is not having a multiple first birth. As shown in Table 1, having a multiple first birth increases the number of children born by about one additional child. For urban women, the impact of twin girls declines slightly with age.

Once again, the impact of a multiple first birth on the number of surviving children is considerably lower. In general, estimates for rural women are lower than for urban women, as mortality rates are generally higher in rural areas. The difference in the impact on total fertility and the number of surviving children is most striking for rural women in sub-Saharan Africa and South Asia, where coefficient estimates range between -0.13 to 0.46. Across all regions, the impact on the number of surviving children is lowest for rural women who have had twin boys, a reflection of higher mortality rates for boys.

For rural South Asian women over 35, the impact of any type of multiple first birth on the number of surviving children is effectively zero. It takes longer for women to adjust their fertility to zero when they have twin girls. This is likely to do with son preference, as women between 25 and 34 are having additional children in order to have a son, and South Asian boys do not generally have lower survival rates than girls (see Table A1 in the Appendix). But by the time women reach the age of 35, they have adjusted their fertility so that they do not have additional surviving children.

For most women, the impact of twin girls and twin boys on the number of surviving children declines with age. One exception is urban women in South Asia, where the effect of twin boys is slightly higher for women 35 and older than it is for women under 25. These differences are likely due to strong son preference in much of this region.

Results for labor force participation are considerably mixed. As we saw earlier, for many urban women, having a multiple first birth of any sex negatively impacts the likelihood of participating in the labor force. The clearest negative impacts are for urban women in South Asia who have a twin boy and girl, urban women in Latin America who had twin boys and are between 25 and 34 years of age, urban women in Latin America who had a twin boy and girl and are under 25 years of age. Rural women in Latin America and the Caribbean who have twin boys and twin girls are also less likely to participate in the labor force.

For women in rural sub-Saharan Africa and rural South Asia, a multiple first birth has a very small impact, if any, on the number of surviving children, particularly when a woman has twin boys. When this is the case, labor force participation rates are also not significantly affected. One exception is the impact of twin girls on rural South Asian women ages 35 and above. While the number of surviving children is not impacted, women in this category are 98% more likely to have worked in the past year. This can possibly be explained by the fact that women in this category have more children born.

Many rural women in sub-Saharan Africa and rural East Asia are more likely to participate in the labor force when they have a multiple first birth. In East Asia, the impact is often quite high, but varies from an increase of 6% to 120%. In sub-Saharan Africa, the largest positive impact on labor force participation is a 39% increase for women 35 and older who have a twin boy and girl. As mentioned in the previous section, this may be due to the fact that rural women often work from home and often face more stringent budget constraints when they have additional children.

3. Impact of Having Son(s) in the First Two Births

Table 3 outlines results from regression (3) where the main regressors are a dummy for the first two children born being of the same sex, a dummy for the first child being a boy, and another for the second child being a boy. From these results, we can see that infant mortality rates do not play a role in determining the effect of the first two children being the same sex, since coefficient estimates on this variable do not differ much between the two fertility outcome measures, the number of children born and the number of surviving children. Most women have more children if their first two were of the same sex, conditional on either of them being a boy. The effect is strongest for women in South Asia and urban East Asia. However, in rural Latin America, coefficient estimates are very close to zero.

However, the effect of having a son in either the first or second birth is significantly lower on the number of surviving children than it is on the number of children ever born, particularly for sub-Saharan Africa and rural areas. In these regions, male infant and child mortality rates are considerably higher than female rates. However, gender differences in mortality rates are not enough to explain these results. In sub-Saharan Africa, male infant mortality rates are only 13% higher than female infant mortality rates, but in Latin America and the Caribbean, they are 30% higher. If the gender differentials in mortality rates were the only explanation for these results, then we would expect to see greater differences in effects on the two fertility outcome measures in Latin America and the Caribbean over sub-Saharan Africa. But the opposite is the case here. For example, while women in rural sub-Saharan Africa have 0.005 fewer children born if their first was a son, they have 0.023 fewer surviving children if their first was a son. In Latin America and the Caribbean, rural women have 0.008 fewer surviving children as a result of the first born being a son. These differences can be explained by the fact that fertility is much higher in sub-Saharan Africa to begin with, and infant mortality rates are much higher than in Latin America and the Caribbean (see Table A1 in the Appendix).

As one might expect, results are quite different for South Asia, since unlike in other parts of the developing world, male infant and child mortality rates are slightly lower in this region than female rates. Coefficient estimates are slightly more negative when the outcome measure is the number of surviving children. But coefficient estimates are also highly negative when the number of children born is the dependent variable. The uniqueness of South Asia in this regard points to the importance of distinguishing differential impacts for different parts of the world. Son preference clearly plays an important role in South Asia, as women have between 0.011 and 0.134 fewer children if the first or second birth is a son. This impact also increases with age, and the increase with age is even greater when the outcome measure is the number of surviving children.

As in earlier sets of regressions, the impact of these shocks to fertility on labor force participation is less consistent. Prior research has found that when fertility increases, women are less likely to participate in the labor force. In the case here, women generally have more children if their first two were of the same sex. In Latin America and the Caribbean, as well as rural areas across all regions, we see that this is indeed the case. But the impact on fertility does not necessarily correspond to an effect of equivalent magnitude when it comes to labor force participation. In fact, the effect on labor force participation in sub-Saharan Africa, South Asia, and East Asia diminishes with age, even though the strongest effects on fertility occur for older women. These results make sense since women have more children when they are young, and have fewer children born or surviving children when they are young than when they are over 35 and are reaching the end of their fertility cycle. Since women are having their children when they are young, labor force participation rates will be most greatly impacted when women are younger, are able to have more children, and have lower opportunity costs of time. This would explain the differences across ages in urban Latin America and rural sub-Saharan Africa.

In terms of the impact of having a son in the first or second birth, since these variables affect fertility only in South Asia, we focus on their impact on labor force participation in this region. In rural South Asia, women have -0.054 fewer children when their first born is a son, and they are 9% more likely to have participated in the labor force in the past year. Just as we had seen a negative impact of having more children, having fewer children means women can spend more time working.

Women in both urban and rural South Asia who are 25 and older are less likely to participate in the labor force if either their first or second born is a son. Urban women are between 4% and 13% less likely to have worked in the past 12 months, and rural women are 1.2% to 10.4% less likely to do so. For these women, having a son means having fewer children to take care of, and sons can also provide family income as they get older. In addition, since having a son is so highly valued in South Asia, women's bargaining power within the household may also be improved by this, and some women could be exercising their improved bargaining position by not working. Since girls are often substitutes for their mother's time, women may also be working less because their oldest children are boys rather than girls, and they have no one to substitute for their time in household production.

Results are also quite similar for women in sub-Saharan Africa. Although the total number of children is not affected by having a son in either of the first two births, women do have fewer surviving children as a result. Women 25 and older are also less likely to have worked in the past 12 months, perhaps since they have fewer children to take care of and do not have a daughter to substitute for their time spent in household production.

4. Impact of Having Same Sex Children in the First Two Births

In Table 4, estimation results for regression (4) are summarized. Once again, we see very strong evidence of son preference in both urban and rural South Asia, and the effects are strongest for rural women. Women whose first born is a son or whose first two children are both sons have fewer children born and fewer surviving children. In contrast, women whose first two children born are both girls have more total children and more surviving children. The effects are quite considerable, and are often statistically significant at the 1% level. For rural South Asian women, we do see the familiar effect of more young women less than 25 years of age working because they have fewer children when their first are sons. This is similar to findings from the U.S. where women with more children work less.

However, the similarities end here. Rural women in South Asia who are 25 and older are less likely to have worked in the past year when they have fewer children as a result of having sons. This is also the case for most urban South Asian women. In contrast, urban South Asian women are 9% to 27% more likely to have worked in the past year if their first two children were daughters, even though they have more children as a result. The explanations discussed in the previous section could explain these results. Urban women who have daughters may have less bargaining power, and therefore are more likely to have to work. Daughters can substitute for women's time at home, so that they can work more in the market. The latter could also explain why rural women are not similarly affected. While daughters are also substitutes in rural areas, rural women often engage in market work activities from their homes. Urban women who do not work as often in the agrarian sector have fewer possibilities for doing so.

In other regions, women exhibit a preference for having at least one child of each sex. This is especially true in East Asia and urban Latin America and the Caribbean. In urban East Asia, women not only have more children born, but they also have more surviving children. In rural East Asia, women have more children born when their first are either both boys or both girls, but they have more surviving children only when their first are girls. This is likely due to the fact that mortality rates are considerably higher in rural areas, and gender difference in infant and child mortality rates may be more pronounced. Male under-five mortality rates are 23%

higher than female rates, and male infant mortality rates are 28% higher (see Table A1 in the Appendix).

We see somewhat similar patterns in rural Latin America, where gender differences in infant and child mortality rates are highest; male mortality rates are about 29% higher (see Table A1 in the Appendix). While women have more children born if their first two are boys, they have fewer children born if their first are girls. But differences in mortality rates result in fewer surviving children if the first two were boys and no effect of having two girls first on the number of surviving children.

In urban and rural sub-Saharan Africa, women have more children born if their first two were boys, and in rural sub-Saharan Africa they also have more children born if their first two were girls. Perhaps in urban areas, there is a slight preference towards boys. But alternatively, since these effects are gone for the number of surviving children, it is likely that urban women are more aware of the mortality differences between boys and girls and they have more children when their first are boys to compensate for this. Urban women have slightly fewer surviving children if their first are sons and more surviving children when their first are girls. In rural areas, while women have more children born when the first two are of the same sex, they only have more surviving children when the first two born are girls. These differences point out the importance of distinguishing effects across the different regions.

In rural sub-Saharan Africa, since women have more children when the first are the same sex, they are 1.8% to 7.2% less likely to participate in the labor force. Since women are having more children, they have less time for work, as had been found in the U.S. Similarly, when women in urban sub-Saharan Africa are having more children because their first two born are boys, they are also less likely to have worked in the past 12 months. The fertility impact is strongest for women 25 and older, and likewise, the impact on labor force participation is negative for women in this age group. While women may have more surviving children when the first two are girls, since they don't have more births, they are in fact more likely to have worked in the past 12 months. Poor women with restrictive budget constraints may be more likely to work because they have more surviving children. Having girls first also means that their oldest daughters can substitute for their own time in household production, leaving them with more opportunities for market work.

CONCLUSION

Birth rates are falling in many developing countries: families are smaller and dependency ratios are lower than among previous generations. As fertility declines, childbearing patterns change in three ways: women may delay their first birth, space their births, or stop having children at an earlier age than previous cohorts. Indeed, the pattern of fertility change differs considerably around the world. In some countries, such as India, women are stopping childbearing at an earlier age than previous cohorts. In some African countries, such as Chad, however, young women can expect to have six children or more during their lifetime. In Ghana, and in the Philippines, women are increasing the interval between births. Each of these changes is likely to have a different impact on the ability of women to work outside the home and on the decisions they make regarding work and child-bearing.

In this paper, we have studied how the impact of fertility shocks on labor force participation varies for women in different developing countries, given that there are pronounced differences in overall fertility rates and gender roles. We have examined the effects of variations in the sex composition of women's first births, both in the case of having twins and a sequence of single births. In doing so, we have seen how variations in sex preferences across countries differentially affect fertility behavior, as well as labor force participation decisions.

In many cases, women who have more children are less likely to have worked in the past year. This is quite similar to previous findings in industrialized countries such as the U.S. However, often times, other factors come into play in the analysis that are particular to developing countries. In South Asia, son preference plays a clear role in determining fertility behavior as a consequence of the sex of the first born. Women often have greater bargaining power when they have a son and can exercise this power by not working. So while women may have less children when their first is a son, they also work less. In addition, daughters are often substitutes for a woman’s time in household production. While women may have more children when their first are daughters, they may be more likely to work because their eldest children can care for younger siblings. This may be less true in rural areas where women can often have more children and continue working from home, since many women engage in agrarian work or work in the informal sector that can be done at home. Gender differences in mortality rates are also important, since women may have more births, but fewer surviving children. This can result in differential impacts on labor force participation rates depending on where women are in the life cycle.

There are a number of limitations to this study. First, only labor force participation rates are observed. If labor supply were observed, we might see different impacts from those found here. Second, labor force participation is only observed for the past year. While women are having children over the course of multiple years, we only observe their most recent labor force participation decision.

Nonetheless, this analysis has provided an important initial step in addressing how in developing countries, women’s labor force participation decisions are affected by fertility. However, much remains to be done. For example, we plan to examine the heterogeneity of the impact of fertility on women’s labor force participation, that is, whether the labor-market consequences of child bearing is more or less likely to be severe for poor and less educated women.

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Table 1. Effect of a Multiple Birth in the First Birth

	Number of Children Ever Born				Number of Surviving Children				Labor Force Participation^			
Age of Women:	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
URBAN WOMEN												
Sub-Saharan Africa	1.028***	1.040***	0.993***	1.064***	0.421***	0.445***	0.440***	0.377***	0.049	0.021	0.100	-0.019
	(0.031)	(0.023)	(0.040)	(0.078)	(0.031)	(0.030)	(0.040)	(0.076)	(0.072)	(0.148)	(0.106)	(0.134)
South Asia	0.985***	0.992***	0.970***	1.013***	0.385***	0.459***	0.404***	0.340***	-0.034	-0.231	-0.207	0.173
	(0.043)	(0.047)	(0.054)	(0.088)	(0.041)	(0.054)	(0.053)	(0.083)	(0.119)	(0.380)	(0.181)	(0.178)
East Asia	0.963***	0.989***	0.989***	0.897***	0.549***	0.734***	0.595***	0.429***	-0.047	0.545	-0.026	-0.196
	(0.058)	(0.061)	(0.061)	(0.116)	(0.054)	(0.070)	(0.059)	(0.108)	(0.140)	(0.462)	(0.195)	(0.216)
Latin America & the Caribbean	0.951***	1.050***	1.000***	0.863***	0.494***	0.607***	0.612***	0.332***	-0.126	-0.086	-0.252**	0.015
	(0.038)	(0.034)	(0.047)	(0.077)	(0.035)	(0.039)	(0.045)	(0.069)	(0.084)	(0.216)	(0.123)	(0.136)
RURAL WOMEN												
Sub-Saharan Africa	1.081***	1.053***	1.067***	1.136***	0.232***	0.252***	0.228***	0.214***	0.048	-0.009	-0.052	0.227**
	(0.024)	(0.018)	(0.031)	(0.059)	(0.025)	(0.025)	(0.033)	(0.060)	(0.058)	(0.118)	(0.085)	(0.112)
South Asia	1.057***	1.061***	1.085***	1.025***	0.119***	0.317***	0.150***	-0.077	0.068	-0.332*	0.162	0.226
	(0.036)	(0.030)	(0.051)	(0.088)	(0.036)	(0.036)	(0.050)	(0.085)	(0.093)	(0.202)	(0.140)	(0.163)
East Asia	0.929***	0.989***	0.934***	0.897***	0.362***	0.451***	0.335***	0.357***	0.241**	0.256	0.434**	-0.010
	(0.051)	(0.041)	(0.059)	(0.104)	(0.047)	(0.049)	(0.056)	(0.096)	(0.118)	(0.300)	(0.173)	(0.189)
Latin America & the Caribbean	1.013***	0.970***	1.025***	1.023***	0.327***	0.450***	0.356***	0.234**	-0.013	-0.147	0.008	0.039
	(0.053)	(0.042)	(0.070)	(0.113)	(0.051)	(0.049)	(0.069)	(0.107)	(0.104)	(0.252)	(0.164)	(0.163)

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

OLS regressions unless otherwise noted.

^ Logit regressions

Additional controls include age at first birth, age at last birth, country and survey year fixed effects.

Age group dummies are also included for regressions of women of all ages 15 to 44.

Table 2. Effect of the Sex of Multiple Birth in the First Birth

	Number of Children Ever Born				Number of Surviving Children				Labor Force Participation^			
Age of Women:	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
URBAN WOMEN												
Sub-Saharan Africa												
Twin Girls	1.004***	1.049***	1.033***	0.940***	0.425***	0.374***	0.493***	0.356**	0.068	0.556**	-0.040	-0.096
	(0.055)	(0.039)	(0.068)	(0.144)	(0.055)	(0.052)	(0.069)	(0.140)	(0.128)	(0.261)	(0.181)	(0.242)
Twin Boys	0.973***	1.036***	0.905***	1.014***	0.307***	0.465***	0.298***	0.224*	-0.008	-0.262	0.060	0.103
	(0.055)	(0.039)	(0.072)	(0.137)	(0.055)	(0.052)	(0.073)	(0.132)	(0.127)	(0.251)	(0.191)	(0.244)
Twin Boy & Girl	1.099***	1.035***	1.031***	1.202***	0.519***	0.495***	0.510***	0.523***	0.084	-0.205	0.265	-0.056
	(0.052)	(0.039)	(0.066)	(0.126)	(0.052)	(0.053)	(0.067)	(0.122)	(0.120)	(0.259)	(0.180)	(0.214)
South Asia												
Twin Girls	0.978***	1.029***	0.976***	0.970***	0.424***	0.508***	0.505***	0.285*	0.336*	-0.192	-0.065	0.932***
	(0.073)	(0.074)	(0.092)	(0.157)	(0.070)	(0.085)	(0.090)	(0.147)	(0.193)	(0.578)	(0.300)	(0.319)
Twin Boys	0.930***	0.945***	0.862***	1.025***	0.324***	0.341***	0.249***	0.407***	0.003	0.170	-0.196	0.063
	(0.070)	(0.074)	(0.094)	(0.137)	(0.067)	(0.085)	(0.091)	(0.129)	(0.192)	(0.533)	(0.306)	(0.281)
Twin Boy & Girl	1.065***	1.012***	1.074***	1.045***	0.419***	0.595***	0.456***	0.300*	-0.595**	-17.134	-0.388	-0.591
	(0.080)	(0.104)	(0.095)	(0.170)	(0.077)	(0.120)	(0.092)	(0.160)	(0.251)	(0.000)	(0.340)	(0.382)
East Asia												
Twin Girls	0.839***	1.003***	0.908***	0.735***	0.523***	0.711***	0.628***	0.377**	-0.161	0.130	-0.177	-0.192
	(0.088)	(0.091)	(0.094)	(0.173)	(0.083)	(0.104)	(0.091)	(0.161)	(0.212)	(0.711)	(0.300)	(0.326)
Twin Boys	1.050***	0.985***	1.074***	0.994***	0.606***	0.666***	0.618***	0.543***	-0.026	0.632	-0.021	-0.176
	(0.090)	(0.097)	(0.093)	(0.182)	(0.084)	(0.111)	(0.090)	(0.169)	(0.215)	(0.745)	(0.297)	(0.335)
Twin Boy & Girl	1.080***	0.959***	0.973***	1.120***	0.465***	0.985***	0.443***	0.272	0.236	1.533	0.414	-0.265
	(0.149)	(0.158)	(0.157)	(0.300)	(0.140)	(0.180)	(0.151)	(0.279)	(0.371)	(1.228)	(0.531)	(0.560)
Latin America & the Caribbean												
Twin Girls	0.939***	1.006***	1.000***	0.819***	0.546***	0.587***	0.665***	0.371***	-0.148	-0.278	-0.276	0.105
	(0.064)	(0.055)	(0.078)	(0.137)	(0.059)	(0.063)	(0.074)	(0.123)	(0.140)	(0.343)	(0.203)	(0.246)
Twin Boys	1.005***	1.105***	1.051***	0.939***	0.487***	0.651***	0.588***	0.346***	-0.135	0.586*	-0.458**	-0.058
	(0.063)	(0.055)	(0.082)	(0.125)	(0.058)	(0.062)	(0.078)	(0.113)	(0.139)	(0.353)	(0.211)	(0.217)
Twin Boy & Girl	0.901***	1.030***	0.947***	0.813***	0.443***	0.566***	0.578***	0.274**	-0.089	-0.977*	0.010	0.018
	(0.069)	(0.071)	(0.083)	(0.140)	(0.063)	(0.080)	(0.079)	(0.126)	(0.155)	(0.522)	(0.228)	(0.248)
RURAL WOMEN												
Sub-Saharan Africa												
Twin Girls	1.026***	1.019***	1.030***	1.042***	0.249***	0.336***	0.223***	0.207*	-0.133	-0.343*	-0.219	0.174
	(0.043)	(0.032)	(0.056)	(0.111)	(0.045)	(0.045)	(0.060)	(0.112)	(0.105)	(0.208)	(0.152)	(0.207)
Twin Boys	1.066***	1.094***	1.044***	1.095***	0.116***	0.120***	0.161***	0.062	0.070	0.005	0.005	0.184
	(0.040)	(0.030)	(0.054)	(0.096)	(0.042)	(0.042)	(0.058)	(0.098)	(0.096)	(0.192)	(0.145)	(0.175)
Twin Boy & Girl	1.143***	1.042***	1.117***	1.261***	0.330***	0.313***	0.290***	0.388***	0.186*	0.310	0.034	0.330*
	(0.040)	(0.031)	(0.051)	(0.101)	(0.042)	(0.043)	(0.054)	(0.103)	(0.102)	(0.218)	(0.142)	(0.200)
South Asia												
Twin Girls	1.091***	1.057***	1.085***	1.171***	0.185***	0.319***	0.252***	-0.063	0.121	-0.460	0.240	0.682**
	(0.061)	(0.046)	(0.083)	(0.164)	(0.060)	(0.056)	(0.082)	(0.159)	(0.155)	(0.303)	(0.231)	(0.332)
Twin Boys	1.075***	1.089***	1.243***	0.874***	0.028	0.198***	0.069	-0.133	0.076	0.256	0.083	-0.043
	(0.059)	(0.053)	(0.084)	(0.130)	(0.059)	(0.064)	(0.084)	(0.126)	(0.150)	(0.346)	(0.234)	(0.236)
Twin Boy & Girl	0.985***	1.035***	0.874***	1.127***	0.160**	0.464***	0.117	0.005	-0.016	-0.960**	0.161	0.275
	(0.071)	(0.059)	(0.098)	(0.171)	(0.070)	(0.071)	(0.098)	(0.165)	(0.180)	(0.469)	(0.263)	(0.316)
East Asia												
Twin Girls	0.932***	0.946***	0.942***	0.905***	0.413***	0.651***	0.378***	0.362**	0.062	-0.270	0.486*	-0.387
	(0.079)	(0.062)	(0.089)	(0.171)	(0.074)	(0.075)	(0.085)	(0.158)	(0.179)	(0.475)	(0.261)	(0.293)
Twin Boys	0.877***	1.029***	0.881***	0.814***	0.269***	0.313***	0.222**	0.299**	0.396**	0.753*	0.250	0.402
	(0.079)	(0.061)	(0.094)	(0.162)	(0.074)	(0.073)	(0.090)	(0.149)	(0.187)	(0.455)	(0.267)	(0.318)
Twin Boy & Girl	1.037***	0.994***	1.039***	1.040***	0.455***	0.242*	0.489***	0.458**	0.314	0.189	0.792*	-0.072
	(0.119)	(0.122)	(0.143)	(0.222)	(0.111)	(0.146)	(0.137)	(0.205)	(0.289)	(0.908)	(0.472)	(0.404)
Latin America & the Caribbean												
Twin Girls	0.918***	0.942***	1.016***	0.807***	0.417***	0.565***	0.629***	0.122	-0.054	-0.382	-0.205	0.250
	(0.087)	(0.066)	(0.117)	(0.193)	(0.084)	(0.077)	(0.116)	(0.183)	(0.175)	(0.409)	(0.281)	(0.281)
Twin Boys	0.999***	0.984***	1.034***	0.961***	0.179**	0.298***	0.241**	0.039	-0.231	-0.089	-0.160	-0.342
	(0.088)	(0.072)	(0.110)	(0.203)	(0.085)	(0.083)	(0.108)	(0.193)	(0.175)	(0.426)	(0.256)	(0.293)
Twin Boy & Girl	1.152***	0.998***	1.021***	1.287***	0.399***	0.472***	0.141	0.513***	0.302	0.135	0.591*	0.165
	(0.098)	(0.085)	(0.145)	(0.190)	(0.095)	(0.099)	(0.143)	(0.180)	(0.193)	(0.486)	(0.338)	(0.273)

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 OLS regressions unless otherwise noted.
^ Logit regressions Additional controls include age at first birth, age at last birth, country and survey year fixed effects.
Age group dummies are also included for regressions of women of all ages 15 to 44.

Table 3. Effect of having Son(s) in the First Two Births

	Number of Children Ever Born				Number of Surviving Children				Labor Force Participation^			
Age of Women:	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
URBAN WOMEN												
Sub-Saharan Africa												
1st 2 children: same sex	0.014*	0.012	0.018*	0.011	0.012	0.000	0.018*	0.008	0.009	0.085*	-0.003	-0.004
	(0.008)	(0.010)	(0.010)	(0.017)	(0.008)	(0.012)	(0.010)	(0.016)	(0.017)	(0.044)	(0.023)	(0.028)
1st child: boy	-0.005	0.016	-0.002	-0.021	-0.023***	-0.016	-0.027***	-0.024	-0.040**	0.005	-0.057**	-0.035
	(0.008)	(0.010)	(0.010)	(0.017)	(0.008)	(0.012)	(0.010)	(0.016)	(0.017)	(0.044)	(0.023)	(0.028)
2nd child: boy	0.012	0.003	0.009	0.015	-0.016**	-0.021*	-0.008	-0.026	-0.015	-0.022	-0.012	-0.018
	(0.008)	(0.010)	(0.010)	(0.017)	(0.008)	(0.012)	(0.010)	(0.016)	(0.017)	(0.044)	(0.023)	(0.028)
South Asia												
1st 2 children: same sex	0.051***	0.010	0.055***	0.058***	0.046***	0.003	0.051***	0.052***	0.033	0.096	0.043	0.011
	(0.008)	(0.014)	(0.010)	(0.014)	(0.008)	(0.016)	(0.010)	(0.013)	(0.020)	(0.082)	(0.031)	(0.029)
1st child: boy	-0.086***	-0.026*	-0.082***	-0.104***	-0.117***	-0.046***	-0.113***	-0.136***	-0.097***	-0.001	-0.072**	-0.136***
	(0.008)	(0.014)	(0.010)	(0.014)	(0.008)	(0.016)	(0.010)	(0.013)	(0.020)	(0.082)	(0.031)	(0.029)
2nd child: boy	-0.065***	-0.011	-0.060***	-0.083***	-0.089***	0.006	-0.077***	-0.121***	-0.073***	-0.140*	-0.039	-0.097***
	(0.008)	(0.014)	(0.010)	(0.014)	(0.008)	(0.016)	(0.010)	(0.013)	(0.020)	(0.082)	(0.031)	(0.029)
East Asia												
1st 2 children: same sex	0.048***	0.006	0.050***	0.045**	0.047***	-0.016	0.067***	0.034*	-0.022	0.165	0.009	-0.061*
	(0.012)	(0.025)	(0.014)	(0.019)	(0.011)	(0.030)	(0.013)	(0.018)	(0.025)	(0.138)	(0.038)	(0.034)
1st child: boy	0.015	-0.010	0.010	0.023	-0.014	-0.030	-0.010	-0.014	0.027	0.025	-0.002	0.047
	(0.012)	(0.025)	(0.014)	(0.019)	(0.011)	(0.030)	(0.013)	(0.018)	(0.025)	(0.138)	(0.038)	(0.034)
2nd child: boy	0.008	0.050**	-0.017	0.019	-0.014	-0.006	-0.021	-0.013	0.030	0.333**	0.026	0.017
	(0.012)	(0.024)	(0.014)	(0.019)	(0.011)	(0.030)	(0.013)	(0.018)	(0.025)	(0.138)	(0.038)	(0.034)
Latin America & the Caribbean												
1st 2 children: same sex	0.023***	0.041***	0.009	0.033**	0.029***	0.021	0.007	0.051***	-0.021	-0.018	-0.041*	-0.001
	(0.008)	(0.012)	(0.010)	(0.014)	(0.007)	(0.013)	(0.009)	(0.013)	(0.016)	(0.050)	(0.023)	(0.023)
1st child: boy	0.013	0.001	0.025**	0.006	-0.008	-0.022*	0.009	-0.020	-0.049***	0.035	-0.038*	-0.078***
	(0.008)	(0.012)	(0.010)	(0.014)	(0.007)	(0.013)	(0.009)	(0.013)	(0.016)	(0.050)	(0.023)	(0.023)
2nd child: boy	0.008	0.010	-0.005	0.019	-0.008	-0.007	-0.019**	0.002	-0.015	0.039	-0.005	-0.036
	(0.008)	(0.012)	(0.010)	(0.014)	(0.007)	(0.013)	(0.009)	(0.013)	(0.016)	(0.050)	(0.023)	(0.023)
RURAL WOMEN												
Sub-Saharan Africa												
1st 2 children: same sex	0.030***	0.023***	0.027***	0.035***	0.015***	0.004	0.017**	0.014	-0.026**	-0.048*	-0.019	-0.023
	(0.005)	(0.006)	(0.007)	(0.012)	(0.006)	(0.008)	(0.007)	(0.012)	(0.012)	(0.029)	(0.017)	(0.021)
1st child: boy	0.002	0.012*	-0.001	0.001	-0.028***	-0.028***	-0.026***	-0.030**	-0.028**	0.030	-0.032*	-0.049**
	(0.005)	(0.006)	(0.007)	(0.012)	(0.006)	(0.008)	(0.007)	(0.012)	(0.012)	(0.029)	(0.017)	(0.021)
2nd child: boy	0.001	-0.004	0.002	-0.001	-0.023***	-0.011	-0.019***	-0.034***	-0.003	0.027	-0.001	-0.024
	(0.005)	(0.006)	(0.007)	(0.012)	(0.006)	(0.008)	(0.007)	(0.012)	(0.012)	(0.029)	(0.017)	(0.021)
South Asia												
1st 2 children: same sex	0.039***	0.013*	0.040***	0.050***	0.034***	-0.020**	0.038***	0.049***	-0.012	0.032	-0.025	-0.009
	(0.006)	(0.008)	(0.008)	(0.012)	(0.006)	(0.009)	(0.008)	(0.012)	(0.014)	(0.039)	(0.020)	(0.023)
1st child: boy	-0.089***	-0.024***	-0.074***	-0.134***	-0.131***	-0.054***	-0.113***	-0.180***	-0.037***	0.085**	-0.012	-0.110***
	(0.006)	(0.008)	(0.008)	(0.012)	(0.006)	(0.009)	(0.008)	(0.012)	(0.014)	(0.039)	(0.020)	(0.023)
2nd child: boy	-0.063***	-0.029***	-0.054***	-0.086***	-0.084***	-0.033***	-0.068***	-0.119***	-0.021	0.036	-0.013	-0.050**
	(0.006)	(0.008)	(0.008)	(0.012)	(0.006)	(0.009)	(0.008)	(0.012)	(0.014)	(0.039)	(0.020)	(0.023)
East Asia												
1st 2 children: same sex	0.025***	0.026*	0.031***	0.019	0.023***	0.013	0.028***	0.021	-0.019	0.000	-0.027	-0.012
	(0.009)	(0.015)	(0.011)	(0.016)	(0.009)	(0.018)	(0.010)	(0.014)	(0.019)	(0.073)	(0.027)	(0.028)
1st child: boy	-0.000	0.041***	-0.004	-0.003	-0.030***	-0.005	-0.032***	-0.032**	-0.021	-0.063	-0.006	-0.031
	(0.009)	(0.015)	(0.011)	(0.016)	(0.009)	(0.018)	(0.010)	(0.014)	(0.019)	(0.073)	(0.027)	(0.028)
2nd child: boy	0.002	0.013	-0.009	0.007	-0.014*	-0.006	-0.031***	-0.002	-0.021	0.138*	-0.027	-0.041
	(0.009)	(0.015)	(0.011)	(0.016)	(0.009)	(0.018)	(0.010)	(0.014)	(0.019)	(0.073)	(0.027)	(0.028)
Latin America & the Caribbean												
1st 2 children: same sex	-0.003	0.019*	-0.010	-0.004	-0.001	-0.006	0.002	-0.004	-0.025	-0.005	-0.028	-0.030
	(0.010)	(0.011)	(0.012)	(0.019)	(0.009)	(0.013)	(0.012)	(0.018)	(0.018)	(0.049)	(0.026)	(0.027)
1st child: boy	0.015	0.015	0.023*	0.008	-0.010	-0.016	0.003	-0.022	-0.039**	-0.016	-0.034	-0.054**
	(0.010)	(0.011)	(0.012)	(0.019)	(0.009)	(0.013)	(0.012)	(0.018)	(0.018)	(0.049)	(0.026)	(0.027)
2nd child: boy	0.020**	0.008	0.017	0.029	-0.003	-0.008	0.005	-0.008	-0.033*	-0.061	-0.045*	-0.010
	(0.010)	(0.011)	(0.012)	(0.019)	(0.009)	(0.013)	(0.012)	(0.018)	(0.018)	(0.049)	(0.026)	(0.027)

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 OLS regressions unless otherwise noted.

^ Logit regressions Additional controls include age at first birth, age at last birth, country and survey year fixed effects.

Age group dummies are also included for regressions of women of all ages 15 to 44.

Table 4. Effect of the Sex of the First Two Births

	Number of Children Ever Born				Number of Surviving Children				Labor Force Participation^			
Age of Women:	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**	**15-44**	**15-24**	**25-34**	**35-44**
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
URBAN WOMEN												
Sub-Saharan Africa												
1st child: boy	-0.017	0.013	-0.011	-0.036	-0.006	0.005	-0.019	0.003	-0.025	0.027	-0.045	-0.017
	(0.012)	(0.014)	(0.014)	(0.024)	(0.012)	(0.017)	(0.014)	(0.023)	(0.023)	(0.062)	(0.033)	(0.040)
1st 2 children: both boys	0.026**	0.015	0.028**	0.026	-0.005	-0.021	0.010	-0.018	-0.005	0.063	-0.016	-0.022
	(0.012)	(0.014)	(0.014)	(0.024)	(0.012)	(0.017)	(0.014)	(0.023)	(0.023)	(0.063)	(0.033)	(0.039)
1st 2 children: both girls	0.002	0.009	0.009	-0.004	0.028**	0.021	0.026*	0.035	0.024	0.107*	0.009	0.013
	(0.012)	(0.014)	(0.014)	(0.024)	(0.012)	(0.018)	(0.014)	(0.023)	(0.024)	(0.063)	(0.033)	(0.040)
South Asia												
1st child: boy	-0.021*	-0.016	-0.022	-0.021	-0.028**	-0.052**	-0.036**	-0.015	-0.025	0.139	-0.033	-0.040
	(0.012)	(0.020)	(0.015)	(0.020)	(0.011)	(0.022)	(0.014)	(0.019)	(0.028)	(0.117)	(0.043)	(0.040)
1st 2 children: both boys	-0.014	-0.001	-0.005	-0.025	-0.043***	0.009	-0.026*	-0.069***	-0.040	-0.043	0.004	-0.085**
	(0.011)	(0.020)	(0.015)	(0.020)	(0.011)	(0.022)	(0.014)	(0.019)	(0.028)	(0.115)	(0.043)	(0.040)
1st 2 children: both girls	0.116***	0.020	0.115***	0.141***	0.136***	-0.003	0.128***	0.173***	0.105***	0.236**	0.083*	0.108***
	(0.012)	(0.020)	(0.015)	(0.021)	(0.011)	(0.023)	(0.014)	(0.019)	(0.029)	(0.117)	(0.044)	(0.041)
East Asia												
1st child: boy	0.007	-0.060*	0.028	0.004	0.001	-0.024	0.012	-0.001	-0.003	-0.308	-0.029	0.030
	(0.017)	(0.035)	(0.020)	(0.027)	(0.016)	(0.043)	(0.019)	(0.025)	(0.036)	(0.199)	(0.054)	(0.049)
1st 2 children: both boys	0.056***	0.057	0.032*	0.065**	0.033**	-0.022	0.045**	0.021	0.008	0.498***	0.036	-0.044
	(0.017)	(0.034)	(0.019)	(0.027)	(0.016)	(0.042)	(0.018)	(0.025)	(0.035)	(0.192)	(0.053)	(0.048)
1st 2 children: both girls	0.040**	-0.044	0.068***	0.026	0.062***	-0.010	0.089***	0.047*	-0.053	-0.167	-0.018	-0.078
	(0.017)	(0.035)	(0.020)	(0.027)	(0.016)	(0.042)	(0.019)	(0.025)	(0.036)	(0.198)	(0.054)	(0.049)
Latin America & the Caribbean												
1st child: boy	0.005	-0.009	0.030**	-0.013	-0.000	-0.015	0.028**	-0.021	-0.034	-0.005	-0.033	-0.042
	(0.012)	(0.017)	(0.014)	(0.020)	(0.011)	(0.018)	(0.013)	(0.018)	(0.022)	(0.071)	(0.033)	(0.033)
1st 2 children: both boys	0.031***	0.051***	0.004	0.052***	0.022**	0.013	-0.012	0.053***	-0.036	0.021	-0.046	-0.037
	(0.011)	(0.016)	(0.014)	(0.020)	(0.010)	(0.018)	(0.013)	(0.018)	(0.022)	(0.069)	(0.032)	(0.032)
1st 2 children: both girls	0.015	0.031*	0.013	0.014	0.037***	0.028	0.026*	0.049***	-0.006	-0.058	-0.036	0.035
	(0.012)	(0.017)	(0.014)	(0.020)	(0.011)	(0.019)	(0.014)	(0.018)	(0.022)	(0.072)	(0.033)	(0.034)
RURAL WOMEN												
Sub-Saharan Africa												
1st child: boy	0.002	0.015*	-0.002	0.002	-0.004	-0.017	-0.007	0.004	-0.025	0.003	-0.031	-0.025
	(0.008)	(0.008)	(0.009)	(0.017)	(0.008)	(0.011)	(0.010)	(0.017)	(0.017)	(0.041)	(0.025)	(0.029)
1st 2 children: both boys	0.031***	0.020**	0.029***	0.034**	-0.008	-0.007	-0.001	-0.020	-0.029*	-0.021	-0.021	-0.048*
	(0.008)	(0.008)	(0.009)	(0.017)	(0.008)	(0.011)	(0.010)	(0.017)	(0.017)	(0.041)	(0.024)	(0.029)
1st 2 children: both girls	0.030***	0.027***	0.025***	0.036**	0.038***	0.014	0.036***	0.048***	-0.023	-0.075*	-0.018	0.001
	(0.008)	(0.009)	(0.009)	(0.017)	(0.008)	(0.011)	(0.010)	(0.017)	(0.017)	(0.042)	(0.025)	(0.030)
South Asia												
1st child: boy	-0.026***	0.005	-0.021*	-0.047***	-0.048***	-0.021	-0.045***	-0.061***	-0.016	0.049	0.001	-0.060*
	(0.009)	(0.011)	(0.011)	(0.017)	(0.008)	(0.013)	(0.011)	(0.017)	(0.020)	(0.055)	(0.029)	(0.032)
1st 2 children: both boys	-0.024***	-0.016	-0.013	-0.037**	-0.050***	-0.053***	-0.030***	-0.070***	-0.033*	0.068	-0.038	-0.059*
	(0.008)	(0.011)	(0.011)	(0.017)	(0.008)	(0.013)	(0.011)	(0.016)	(0.020)	(0.054)	(0.029)	(0.031)
1st 2 children: both girls	0.102***	0.043***	0.094***	0.136***	0.117***	0.014	0.106***	0.168***	0.009	-0.005	-0.012	0.041
	(0.009)	(0.012)	(0.011)	(0.018)	(0.008)	(0.013)	(0.011)	(0.017)	(0.020)	(0.056)	(0.029)	(0.032)
East Asia												
1st child: boy	-0.002	0.028	0.005	-0.010	-0.016	0.001	-0.000	-0.030	0.000	-0.201**	0.021	0.010
	(0.013)	(0.020)	(0.015)	(0.022)	(0.012)	(0.025)	(0.014)	(0.021)	(0.026)	(0.102)	(0.038)	(0.039)
1st 2 children: both boys	0.026**	0.039*	0.022	0.026	0.009	0.008	-0.004	0.019	-0.040	0.138	-0.054	-0.052
	(0.013)	(0.020)	(0.015)	(0.022)	(0.012)	(0.025)	(0.014)	(0.020)	(0.026)	(0.101)	(0.037)	(0.038)
1st 2 children: both girls	0.023*	0.013	0.040***	0.012	0.037***	0.019	0.059***	0.023	0.002	-0.138	0.000	0.029
	(0.013)	(0.021)	(0.015)	(0.023)	(0.012)	(0.026)	(0.014)	(0.021)	(0.027)	(0.105)	(0.039)	(0.040)
Latin America & the Caribbean												
1st child: boy	-0.005	0.007	0.005	-0.020	-0.007	-0.009	-0.002	-0.014	-0.007	0.045	0.011	-0.044
	(0.014)	(0.016)	(0.017)	(0.028)	(0.013)	(0.018)	(0.017)	(0.026)	(0.025)	(0.069)	(0.037)	(0.039)
1st 2 children: both boys	0.016	0.027*	0.008	0.025	-0.004	-0.014	0.007	-0.012	-0.058**	-0.066	-0.073**	-0.040
	(0.014)	(0.016)	(0.017)	(0.027)	(0.013)	(0.018)	(0.016)	(0.026)	(0.025)	(0.068)	(0.036)	(0.038)
1st 2 children: both girls	-0.023	0.011	-0.027	-0.033	0.002	0.001	-0.003	0.005	0.007	0.056	0.017	-0.019
	(0.014)	(0.016)	(0.017)	(0.028)	(0.014)	(0.018)	(0.017)	(0.026)	(0.025)	(0.070)	(0.038)	(0.039)

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 OLS regressions unless otherwise noted.
^ Logit regressions Additional controls include age at first birth, age at last birth, country and survey year fixed effects.
Age group dummies are also included for regressions of women of all ages 15 to 44.

APPENDIX

Table A1. Sex Ratios and Mortality Rates by Country and Region (2000-2005)

	Sex ratio at birth	Infant mortality rate by sex				Under-five mortality by sex			
Country or Region	(per 1,000 population)	Both sexes	Male	Female	% Difference	Both sexes	Male	Female	% Difference
South-Central Asia	1.07	63.5	63.3	63.7	-0.6%	91	88	95	-7.4%
Bangladesh	1.04	57.2	59.4	54.9	8.2%	77	77	76	1.3%
India	***1.08***	61.8	61.2	62.4	-1.9%	90	86	95	-9.5%
Indonesia	1.05	34.2	38.5	29.7	29.6%	42	47	37	27.0%
Nepal	1.05	54.7	54.8	54.6	0.4%	73	70	75	-6.7%
Pakistan	1.05	70.6	68.5	72.7	-5.8%	100	96	104	-7.7%
South-Eastern Asia	1.05	33.5	37.6	29.3	28.3%	44	48	39	23.1%
Cambodia	1.05	72.4	76.2	68.4	11.4%	104	107	101	5.9%
Philippines	1.06	27.7	32.5	22.7	43.2%	33	39	27	44.4%
Viet Nam	1.05	22.3	25.4	19.2	32.3%	27	31	23	34.8%
Latin America and the Caribbean	1.05	25.8	29	22.4	29.5%	32	36	28	28.6%
Bolivia	1.05	55.6	60	51	17.6%	72	77	67	14.9%
Brazil	1.05	27.3	30.9	23.4	32.1%	34	39	29	34.5%
Colombia	1.05	20.5	23.4	17.4	34.5%	28	32	25	28.0%
Dominican Republic	1.05	35.1	39.8	30.1	32.2%	40	45	34	32.4%
Guatemala	1.05	38.6	44	33	33.3%	48	54	42	28.6%
Haiti	1.05	69.5	76.1	62.6	21.6%	94	102	86	18.6%
Honduras	1.05	31.6	35.9	27.1	32.5%	44	49	39	25.6%
Nicaragua	1.05	26.4	29.9	22.8	31.1%	32	36	28	28.6%
Peru	1.05	30.3	33.8	26.7	26.6%	40	45	34	32.4%
Sub-Saharan Africa	1.03	94.8	100.6	88.8	13.3%	161	167	154	8.4%
Benin	1.04	93.5	96.5	90.3	6.9%	137	139	134	3.7%
Burkina Faso	1.05	86.8	90.4	83.1	8.8%	172	175	169	3.6%
Cameroon	1.03	89.4	95.2	83.4	14.1%	149	156	143	9.1%
Central African Republic	1.03	113.1	124.7	101.2	23.2%	192	208	175	18.9%
Comoros	1.05	57.7	64.8	50.2	29.1%	77	86	68	26.5%
Congo	1.03	76.6	82.1	71	15.6%	124	130	117	11.1%
Côte d'Ivoire	1.02	92.3	97.4	87	12.0%	133	140	127	10.2%
Eritrea	1.03	61.8	65.1	58.3	11.7%	88	92	83	10.8%
Ethiopia	1.03	88	94.6	81.3	16.4%	149	156	141	10.6%
Gabon	1.03	58.2	62.5	53.8	16.2%	90	95	85	11.8%
Ghana	1.05	70.4	72.8	67.9	7.2%	113	114	112	1.8%
Guinea	1.06	110	117.2	102.4	14.5%	172	182	162	12.3%
Kenya	1.03	70.5	76.3	64.4	18.5%	114	121	106	14.2%
Liberia	1.03	103.3	108	98.4	9.8%	159	165	154	7.1%
Lesotho	1.03	79	85.7	72.1	18.9%	116	123	108	13.9%
Madagascar	1.02	74.7	80	69.4	15.3%	117	122	112	8.9%
Malawi	1.03	96.5	100.4	92.4	8.7%	145	149	141	5.7%
Mali	1.03	113.4	117.5	109.3	7.5%	210	213	207	2.9%
Mauritania	***1.08***	72.7	77.8	67.2	15.8%	121	128	113	13.3%
Mozambique	1.03	102.9	110.5	95.2	16.1%	177	186	167	11.4%
Namibia	1.03	49.4	54.8	43.9	24.8%	73	79	66	19.7%
Niger	1.04	108.1	111.4	104.6	6.5%	209	208	211	-1.4%
Nigeria	1.04	113.8	118.3	109.2	8.3%	199	202	197	2.5%
Rwanda	1.01	108.8	116.6	100.8	15.7%	171	182	159	14.5%
Chad	1.03	132	139.8	124	12.7%	214	223	205	8.8%
Senegal	1.03	62	65.5	58.3	12.3%	129	135	124	8.9%
Togo	1.02	81	86.8	75.1	15.6%	114	121	106	14.2%
Uganda	1.03	82.3	87.8	76.6	14.6%	138	144	131	9.9%
United Republic of Tanzania	1.03	74	78.7	69.2	13.7%	125	130	119	9.2%
South Africa	1.03	59.1	63.9	54.1	18.1%	86	93	78	19.2%
Zambia	1.03	104.3	111.1	97.4	14.1%	177	185	169	9.5%
Zimbabwe	1.02	68.9	73.4	64.4	14.0%	112	117	106	10.4%

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat,
World Population Prospects: The 2008 Revision, http://esa.un.org/unpp, accessed on April 15, 2009

Table A2. Age-specific Fertility Rates by Country and Region (2000-2005)

Country or Region	15-19	20-24	25-29	30-34	35-39	40-44	45-49
South-Central Asia	73.2	214.8	174.4	98.4	48.3	18.1	6.2
Bangladesh	94.4	175.5	140.7	84.5	45.6	16.0	3.6
India	79.4	231.2	169.5	85.5	38.4	13.8	4.9
Indonesia	47.4	121.8	132.5	91.9	61.1	17.8	3.8
Nepal	115.5	248.4	169.3	101.2	59.7	24.4	3.9
Pakistan	48.3	195.9	249.7	197.9	119.1	54.5	22.1
South-Eastern Asia	38.7	123.4	147.0	102.6	61.0	19.8	3.4
Cambodia	46.2	172.1	178.4	141.8	93.4	42.4	6.9
Philippines	48.6	166.6	181.6	134.9	91.2	39.9	4.9
Viet Nam	19.7	106.6	173.5	96.1	44.2	9.7	0.2
Latin America and the Caribbean	80.4	137.1	125.2	87.5	49.4	16.8	3.1
Bolivia	84.4	194.1	187.6	154.0	109.3	50.4	11.9
Brazil	86.0	131.1	110.9	69.0	37.5	13.0	2.6
Colombia	95.7	141.6	121.7	84.8	45.3	18.8	2.1
Dominican Republic	109.6	179.8	133.7	93.1	37.7	9.7	2.4
Guatemala	115.4	238.1	218.2	174.0	115.9	48.8	9.6
Haiti	52.5	162.1	186.1	173.9	134.9	65.5	25.0
Honduras	102.5	200.2	167.5	131.8	88.1	45.6	8.9
Nicaragua	119.4	158.8	139.3	98.5	56.4	21.4	6.2
Peru	61.5	134.4	132.8	115.6	77.0	33.3	5.4
Sub-Saharan Africa	127.5	240.8	248.4	213.9	152.4	73.6	25.5
Benin	117.5	261.7	271.6	237.1	163.0	76.9	30.3
Burkina Faso	136.8	275.6	268.7	235.9	180.3	97.0	33.1
Cameroon	136.5	233.5	228.5	192.0	124.7	52.4	15.8
Central African Republic	122.5	220.8	221.7	192.4	144.6	83.5	74.5
Comoros	50.4	169.3	226.4	202.3	121.8	51.7	18.1
Congo	128.7	220.5	199.6	184.5	133.6	68.8	21.0
Côte d'Ivoire	135.5	221.6	226.7	193.3	144.0	63.6	24.9
Eritrea	80.7	195.2	219.3	217.8	179.8	97.0	47.8
Ethiopia	106.8	249.9	271.0	246.4	177.2	93.9	28.2
Gabon	107.1	201.2	175.2	127.7	85.7	46.1	13.0
Ghana	76.2	187.3	215.2	187.1	144.7	72.7	24.4
Guinea	168.0	248.5	253.2	225.7	160.7	81.2	22.8
Kenya	104.2	243.6	236.7	183.4	133.9	58.3	39.9
Liberia	144.8	250.6	234.6	202.6	159.1	90.4	40.8
Lesotho	89.6	195.2	170.8	133.7	106.4	52.0	10.9
Madagascar	149.5	250.6	236.5	190.3	138.1	72.4	18.3
Malawi	158.9	289.7	251.1	220.8	160.9	87.3	37.8
Mali	164.8	244.4	246.1	215.9	162.5	82.4	22.3
Mauritania	94.5	175.9	211.0	202.0	154.8	98.5	43.0
Mozambique	176.4	250.8	235.3	187.4	137.0	72.4	44.5
Namibia	81.7	165.9	165.1	150.3	121.2	55.8	21.6
Niger	215.6	313.2	311.4	274.6	207.6	109.0	44.3
Nigeria	130.5	234.9	274.6	240.5	165.6	69.2	19.3
Rwanda	43.7	229.0	285.4	259.6	198.0	115.0	31.3
Chad	189.6	304.6	294.1	266.1	170.5	66.9	16.6
Senegal	105.8	218.0	247.7	229.3	166.7	80.1	22.9
Togo	78.3	206.5	235.0	192.3	151.5	75.9	27.1
Uganda	171.5	332.3	303.5	250.7	172.7	75.5	34.5
United Republic of Tanzania	132.0	272.8	253.5	217.6	156.4	80.5	19.2
South Africa	70.7	139.0	141.8	105.6	67.4	27.1	8.8
Zambia	160.3	283.0	267.4	226.4	174.2	78.9	29.7
Zimbabwe	75.2	191.7	175.6	139.0	98.5	51.9	16.0

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, http://esa.un.org/unpp, accessed on April 15, 2009

Table A3. Summary Statistics

Variable	Urban Women w/ 1+ Children			Rural Women w/ 1+ Children			Urban Women w/ 2+ Children			Rural Women w/ 1+ Children		
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
Dependent Variables:												
Number of Children Born	108774	3.2355	2.2349	224817	3.9476	2.5125	79977	4.0404	2.0847	182707	4.6270	2.3029
Sub-Saharan Africa	70872	2.7544	1.6352	140155	3.2696	1.9473	55165	3.2540	1.5196	115014	3.7657	1.8025
South Asia	42036	2.6026	1.6436	83707	3.0519	1.9532	30091	3.2388	1.5328	64372	3.6682	1.8212
East Asia	113198	2.7008	1.7575	81186	3.6372	2.4093	81195	3.3712	1.6481	64962	4.2958	2.2547
Latin America & the Caribbean												
Number of Surviving Children												
Sub-Saharan Africa	108191	2.8143	1.9253	222403	3.2236	2.0692	79568	3.4958	1.8052	180734	3.7603	1.9261
South Asia	70872	2.5257	1.4277	140155	2.8487	1.6298	55165	2.9683	1.3140	115014	3.2655	1.5021
East Asia	42036	2.4433	1.4803	83707	2.7440	1.6907	30091	3.0241	1.3661	64372	3.2766	1.5749
Latin America & the Caribbean	113198	2.5250	1.5660	81186	3.2857	2.1045	81195	3.1343	1.4485	64962	3.8652	1.9612
Labor Force Participation												
Sub-Saharan Africa	105358	0.6297	0.4836	217460	0.7050	0.4560	77500	0.6576	0.4745	176850	0.7206	0.4487
South Asia	67353	0.3109	0.4652	128958	0.5192	0.4996	52520	0.3222	0.4703	106171	0.5378	0.4986
East Asia	42018	0.5295	0.5060	83686	0.6492	0.4808	30077	0.5367	0.5034	64352	0.6768	0.4725
Latin America & the Caribbean	111220	0.6320	0.4823	79267	0.4987	0.5000	79788	0.6328	0.4821	63416	0.5045	0.5000
Independent Variables:												
Twin at First Birth	108774	0.0098	0.0985	224817	0.0086	0.0922	79977	0.0133	0.1146	182707	0.0106	0.1022
Sub-Saharan Africa	70872	0.0058	0.0760	140155	0.0047	0.0685	55165	0.0075	0.0861	115014	0.0057	0.0755
South Asia	42036	0.0057	0.0752	83707	0.0051	0.0710	30091	0.0079	0.0886	64372	0.0066	0.0809
East Asia	113198	0.0063	0.0790	81186	0.0058	0.0756	81195	0.0088	0.0932	64962	0.0072	0.0845
Latin America & the Caribbean												
Twin Girls	108774	0.0031	0.0556	224817	0.0026	0.0505	79977	0.0042	0.0648	182707	0.0031	0.0560
Sub-Saharan Africa	70872	0.0020	0.0449	140155	0.0017	0.0409	55165	0.0026	0.0508	115014	0.0020	0.0452
South Asia	42036	0.0025	0.0499	83707	0.0021	0.0453	30091	0.0035	0.0587	64372	0.0027	0.0516
East Asia	113198	0.0022	0.0468	81186	0.0021	0.0457	81195	0.0031	0.0553	64962	0.0026	0.0511
Latin America & the Caribbean												
Twin Boys												
Sub-Saharan Africa	108774	0.0032	0.0563	224817	0.0030	0.0546	79977	0.0043	0.0655	182707	0.0037	0.0606
South Asia	70872	0.0021	0.0461	140155	0.0018	0.0419	55165	0.0027	0.0522	115014	0.0021	0.0462
East Asia	42036	0.0023	0.0482	83707	0.0021	0.0458	30091	0.0033	0.0570	64372	0.0027	0.0522
Latin America & the Caribbean	113198	0.0023	0.0476	81186	0.0020	0.0446	81195	0.0032	0.0562	64962	0.0025	0.0499
Twin Boy & Girl												
Sub-Saharan Africa	108774	0.0035	0.0592	224817	0.0030	0.0550	79977	0.0048	0.0690	182707	0.0037	0.0609
South Asia	70872	0.0017	0.0408	140155	0.0013	0.0357	55165	0.0021	0.0462	115014	0.0016	0.0394
East Asia	42036	0.0009	0.0293	83707	0.0009	0.0301	30091	0.0012	0.0346	64372	0.0012	0.0343
Latin America & the Caribbean	113198	0.0018	0.0425	81186	0.0017	0.0407	81195	0.0025	0.0502	64962	0.0021	0.0455
1st 2 children: same sex												
Sub-Saharan Africa	108774	0.4973	0.5000	224817	0.5061	0.5000	79977	0.4997	0.5000	182707	0.5085	0.4999
South Asia	70872	0.4879	0.4999	140155	0.4940	0.5000	55165	0.4937	0.5000	115014	0.4996	0.5000
East Asia	42036	0.4977	0.5000	83707	0.4991	0.5000	30091	0.5040	0.5000	64372	0.5032	0.5000
Latin America & the Caribbean	113198	0.4975	0.5000	81186	0.4990	0.5000	81195	0.5017	0.5000	64962	0.5019	0.5000

Table A3. Summary Statistics, continued

	Urban Women w/ 1+ Children			Rural Women w/ 1+ Children			Urban Women w/ 2+ Children			Rural Women w/ 1+ Children		
Variable	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.
1st child: boy												
Sub-Saharan Africa	108774	0.5062	0.5000	224817	0.5050	0.5000	79977	0.5050	0.5000	182707	0.5051	0.5000
South Asia	70872	0.5163	0.4997	140155	0.5154	0.4998	55165	0.5117	0.4999	115014	0.5118	0.4999
East Asia	42036	0.5134	0.4998	83707	0.5190	0.4996	30091	0.5115	0.4999	64372	0.5204	0.4996
Latin America & the Caribbean	113198	0.5129	0.4998	81186	0.5143	0.4998	81195	0.5127	0.4998	64962	0.5146	0.4998
2nd child: boy												
Sub-Saharan Africa	108774	0.3723	0.4834	224817	0.4104	0.4919	79977	0.5063	0.5000	182707	0.5050	0.5000
South Asia	70872	0.4082	0.4915	140155	0.4241	0.4942	55165	0.5244	0.4994	115014	0.5168	0.4997
East Asia	42036	0.3728	0.4835	83707	0.3991	0.4897	30091	0.5208	0.4996	64372	0.5189	0.4996
Latin America & the Caribbean	113198	0.3657	0.4816	81186	0.4107	0.4920	81195	0.5099	0.4999	64962	0.5132	0.4998
1st 2 children: both boys												
Sub-Saharan Africa	108774	0.1879	0.3906	224817	0.2107	0.4078	79977	0.2555	0.4362	182707	0.2593	0.4383
South Asia	70872	0.2062	0.4046	140155	0.2167	0.4120	55165	0.2649	0.4413	115014	0.2641	0.4408
East Asia	42036	0.1920	0.3938	83707	0.2086	0.4063	30091	0.2682	0.4430	64372	0.2713	0.4446
Latin America & the Caribbean	113198	0.1880	0.3907	81186	0.2120	0.4087	81195	0.2621	0.4398	64962	0.2649	0.4413
1st 2 children: both girls												
Sub-Saharan Africa	108774	0.3094	0.4623	224817	0.2954	0.4562	79977	0.2442	0.4296	182707	0.2492	0.4325
South Asia	70872	0.2817	0.4498	140155	0.2773	0.4476	55165	0.2288	0.4200	115014	0.2355	0.4243
East Asia	42036	0.3058	0.4607	83707	0.2905	0.4540	30091	0.2358	0.4245	64372	0.2320	0.4221
Latin America & the Caribbean	113198	0.3094	0.4623	81186	0.2870	0.4524	81195	0.2395	0.4268	64962	0.2370	0.4253
Age at First Birth												
Sub-Saharan Africa	108191	19.1377	3.7041	222403	18.5153	3.3438	79568	18.7973	3.5200	180734	18.3264	3.2705
South Asia	70872	19.8991	3.8606	140155	18.6220	3.3554	55165	19.3403	3.5343	115014	18.3491	3.1638
East Asia	42036	21.6165	4.0936	83707	20.2569	3.7510	30091	21.0590	3.8210	64372	19.9361	3.5692
Latin America & the Caribbean	113198	20.2938	4.1446	81186	19.1188	3.6216	81195	19.7705	3.7861	64962	18.8640	3.4118
Age at Last Birth												
Sub-Saharan Africa	108191	26.1435	6.2259	222403	26.8868	6.5394	79568	28.1621	5.6129	180734	28.5241	5.9545
South Asia	70872	25.1836	4.7072	140155	25.1074	5.3342	55165	25.9978	4.5000	115014	26.1507	5.0308
East Asia	42036	27.4021	5.3618	83707	27.0498	5.8040	30091	28.9600	4.8903	64372	28.6345	5.2764
Latin America & the Caribbean	113198	26.0429	5.6585	81186	26.4943	6.2808	81195	27.6064	5.2333	64962	27.9684	5.8328
Age at time of Survey												
Sub-Saharan Africa	108774	30.1475	7.0266	224817	29.9127	7.1673	79977	32.0775	6.3796	182707	31.4941	6.5576
South Asia	70872	31.7247	6.7572	140155	30.4393	7.0952	55165	33.0809	6.2191	115014	31.8756	6.5146
East Asia	42036	32.6993	6.4720	83707	31.9694	6.7534	30091	34.5978	5.6730	64372	33.7441	5.9512
Latin America & the Caribbean	113198	31.5600	7.0710	81186	30.6956	7.3292	81195	33.4741	6.3137	64962	32.3454	6.6490

Table A4. Demographic & Health Surveys

Country	Survey Years		No. Obs.	Percent
Armenia	2000	2005	12,996	0.92
Bangladesh	2004	2004	11,440	0.81
Bangladesh	1993	2000	28,266	1.99
Benin	2006	2006	17,794	1.26
Benin	2001	2001	6,219	0.44
Benin	1996	1996	5,491	0.39
Bolivia	2003	2004	17,654	1.25
Bolivia	1993	1998	19,790	1.4
Brazil	1996	1996	12,612	0.89
Burkina Faso	2003	2003	12,477	0.88
Burkina Faso	1998	1999	6,445	0.45
Cambodia	2005	2006	16,823	1.19
Cambodia	2000	2000	15,351	1.08
Cameroon	2004	2004	10,656	0.75
Cameroon	1998	1998	5,501	0.39
CAR	1994	1995	5,884	0.42
Chad	1996	1997	7,454	0.53
Colombia	2000	2005	52,929	3.74
Colombia	1995	1995	11,140	0.79
Comoros	1996	1996	3,050	0.22
Congo (Brazzaville)	2005	2005	7,051	0.5
Cote d'Ivoire	1994	1999	10,372	0.73
Dominican Republic	2007	2007	28,676	2.02
Dominican Republic	2002	2002	23,384	1.65
Dominican Republic	1996	1999	9,708	0.69
Egypt	2000	2005	44,165	3.12
Egypt	1995	1996	14,779	1.04
Eritrea	1995	1996	5,054	0.36
Ethiopia	1992	1997	29,241	2.06
Gabon	2000	2001	6,183	0.44
Ghana	2003	2003	5,691	0.4
Ghana	1998	1999	4,843	0.34
Guatemala	1995	1999	16,801	1.19
Guinea	2005	2005	7,954	0.56
Guinea	1999	1999	6,753	0.48
Haiti	2005	2006	10,757	0.76
Haiti	2000	2000	10,159	0.72
Haiti	1994	1995	5,356	0.38
Honduras	2005	2006	19,948	1.41
India	2005	2006	124,385	8.78
India	1998	2000	90,303	6.37
Indonesia	2002	2003	29,483	2.08
Indonesia	1994	1997	51,998	3.67
Jordan	2007	2007	10,876	0.77
Jordan	2002	2002	6,006	0.42
Jordan	1997	1997	5,548	0.39
Kazakhstan	1995	1999	8,544	0.6
Kenya	2003	2003	8,195	0.58
Kenya	1998	1998	7,881	0.56
Kyrgyz Republic	1997	1997	3,848	0.27
Lesotho	2004	2005	7,095	0.5
Liberia	2006	2007	7,092	0.5
Madagascar	2003	2004	7,949	0.56
Madagascar	1997	1997	7,060	0.5

Table A4. Demographic & Health Surveys

Country	Survey Years		No. Obs.	Percent
Malawi	2000	2005	24,918	1.76
Mali	2006	2006	14,583	1.03
Mali	2001	2001	12,849	0.91
Mali	1995	1996	9,704	0.68
Mauritania	2000	2001	7,728	0.55
Moldova	2005	2005	7,440	0.53
Morocco	2003	2004	16,798	1.19
Mozambique	2003	2004	12,418	0.88
Mozambique	1997	1997	8,779	0.62
Namibia	2006	2007	9,804	0.69
Namibia	2000	2000	6,755	0.48
Nepal	2006	2006	10,793	0.76
Nepal	2001	2001	8,726	0.62
Nepal	1996	1996	8,429	0.59
Nicaragua	2001	2001	13,060	0.92
Nicaragua	1997	1998	13,634	0.96
Niger	2006	2006	9,223	0.65
Niger	1998	1998	7,577	0.53
Nigeria	2003	2003	7,620	0.54
Nigeria	1999	1999	9,810	0.69
Pakistan	2006	2007	10,023	0.71
Peru	2000	2005	40,308	2.84
Peru	1996	1996	28,951	2.04
Philippines	2003	2003	13,633	0.96
Philippines	1998	1998	13,983	0.99
Rwanda	2000	2005	21,705	1.53
Senegal	2005	2005	14,602	1.03
South Africa	1998	1998	11,735	0.83
Tanzania	2004	2005	10,329	0.73
Tanzania	1996	1999	11,972	0.84
Togo	1998	1998	8,569	0.6
Turkey	2003	2004	8,075	0.57
Turkey	1998	1998	8,576	0.61
Uganda	2006	2006	8,531	0.6
Uganda	2000	2001	7,246	0.51
Uganda	1995	1995	7,070	0.5
Uzbekistan	1996	1996	4,415	0.31
Vietnam	1997	2002	11,321	0.8
Yemen	1997	1997	10,414	0.73
Zambia	2001	2002	7,658	0.54
Zambia	1996	1997	8,021	0.57
Zimbabwe	1994	1994	6,128	0.43
Total			1,417,023	100