Reproductive Health Laws, Fertility and Female Labor Force Participation[1]

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Introduction

During the demographic transition, changes in the fertility rate across cohorts of women are subject to household or individual preferences and are determined simultaneously with household or individual behavior.

In Bloom, Canning, Fink and Finlay (2009) we used cross-country panel data to identify the causal effect of fertility decline on female labor force participation. We found that at the country level every child less in the total fertility rate count increased female labor force participation by 18 percent – an increase of about 2 years of work during a woman's fertile years.

At the household level, fertility changes are driven in part by preferences and are simultaneous with other behavioral decisions such as female labor force participation. Due to the simultaneity of the fertility/female labor force participation decision, methods to identify the causal link from fertility changes to labor force participation must be applied. In this paper we employ an instrumental variable that we newly developed that captures the legal changes in abortion, contraceptive pill, condom, IUD and voluntary sterilization. With this index we explain, in part, changes in fertility rates and then how these fertility rates affected female labor force participation.

There is much written with regard to the effect of family planning policies on fertility outcomes, (Farley and Samuel 1981; Bongaarts 1994; Foster and Roy 1997; Klerman 1999; Levine, Staiger, Kane and Zimmerman 1999; Molyneaux and Gertler 2000; Ross and Stover 2001; United Nations Population Division 2003; Bjorklund 2006; McDonald 2006). Others who focus on the general theme of fertility trends and economic development (Brander and Dowrick 1994; Walle and Luca 2006; Bloom, Canning, Fink and Finlay 2008; Skirbekk 2008), and those more specifically on the relationship between fertility and female labor market activity (Smith and Ward 1985; Goldin 1995; Klepinger, Lundberg and Plotnick 1999; Mammen and Paxson 2000; Caucutt, Guner and Knowles 2002; Goldin and Katz 2002; Vere 2007).

The simultaneity of the fertility and female labor force decision has long been recognized (Cain and Dooley 1976), and an identification strategy is required to isolate the effect of fertility on female labor force participation. Lower fertility frees up time for women to remain in the workforce, but also being in the workforce raises the opportunity cost of having children (Schultz 2009).

To identify the causal effect of fertility on female labor force participation, an instrumental variable approach can be applied. There have been many studies that focus on the effect of fertility decline on female labor force participation within the United States using a variety of instrumental variables to identify a causal relationship. Rosenzweig and Wolpin (1980a; 1980b) use twins as an instrument for fertility, exploiting the fact that the arrival of an extra birth is random and independent of labor supply. They find that an extra child will reduce female labor force participation by 10 per cent. Angrist and Evans (1996) use variation in US state abortion laws to identify the effect of fertility on schooling and labor force outcomes. Then in 1998 Angrist and Evans (1998) used twins as an instrument and compared this to results generated by an instrument based on sibling-sex composition. The latter instrument is derived from the observation that US parents with two children are more likely to have a third child if the first two children are of the same sex. Sex composition of the children is considered random and affects labor supply only through the change in fertility. Carrasco (2001) uses PSID data and sibling-sex composition to identify that each child less increases female labor force participation by 38 percent – an estimate nearly four times that of Rosenzweig and Wolpin (1980b). Kalist (2004) uses variation in abortion laws across states in the US as an instrument to find a 7 percent marginal effect of fertility on female labor force participation. Bailey (2006) uses US state variation in the laws associated with access to the contraceptive pill for young women as an instrument to find that childbearing reduces the probability of entry into the workforce for young women.

While the evidence for a positive effect of fertility decline on female labor force participation in the US has much support, there is a scattering of work on the causal effect of fertility on female labor force participation in a developing country context. An exception to this is work by Miller (2007) who explores the effect of family planning programs on fertility in the developing world by examining the fertility response to the PROFAMILIA of Columbia. Miller (2007) finds that family planning explained 10 percent of the fertility decline in Colombia during the demographic transition. Rozenzweig and Zhang (2009) find that in the case of China's one child policy, that this population policy has had little effect in the development of its human capital which is the hypothesis of the quality-quantity trade off. In examining the relationship between fertility and female labor force participation in the developing world, Porter and King (2009) use the Demographic and Health Surveys to find that women have more children if they have twins in their first birth, or have the first two births are the same sex. They find that women who have a boy in their first or second birth are less likely to work in the developing world. Bloom and Canning (2003) show that in Ireland the legalization of contraception in the 1980s led to a dramatic decline in the fertility rate and an increase in the working-age share. The sharp increase in the working-age share brings with it benefits at the macro level and the number of workers increases relative to the dependent population (Bloom, Canning and Sevilla 2003). Cruces and Galiani (2007) find in a sample of Latin American countries using sibling-sex composition as an instrument find an 8 percent marginal effect of fertility on female labor force participation. Using a sample from South American countries, Agüero and Marks (2008) use self-reported infertility as an instrument and find that there is no effect of fertility on female labor force participation in their sample.

It is noted that female labor in a developing country context is difficult to quantify (Donahoe 1999), but in using the Demographic and Health Survey we are able to account for labor force participation in both the formal and informal sectors. Participation is also measured at the extensive margin in the DHS and measurement error associated with the intensive margin is avoided.

In this paper we analyze the effect of fertility changes on female labor force participation in a developing country context. We use variation in reproductive health laws to identify the effect of fertility on female labor force participation. We use data on abortion laws, contraceptive (pill, condom, IUD) laws, and voluntary sterilization laws as an instrument for fertility.

In this paper we outline the data we use for this study, show the estimation strategy and present the results before offering conclusions.

Data

Demographic and Health Survey

Data for employment, education and fertility are taken from the Demographic and Health Survey (DHS). The DHS subsumed the World Fertility Survey in 1985 and is administered by Macro International. The survey is designed to capture information on maternal and reproductive health. It has detailed child history information, employment status, and education history. Surveys are issued to women between the ages of 15 and 49 (from aged 10 in some countries such as Bangladesh). There are 76 low- and middle-income countries in the survey, with up to five surveys over time within a country. These datasets are not a panel, and surveys are randomized at the cluster level where clusters changed between surveys. We merge all the DHS surveys across years and countries. For this project we had to recode the regions as there were inconsistencies within a country across the different years. We also recoded religion to ensure consistency across surveys.

In this study, we restrict the analysis to women between the ages of 18 and 49, and break them into two age groups: 18 to 32, and 33 to 49. We also stratify by urban and rural place of residence, and further take account of differences in religion.

Index of Reproductive Health Laws

The data we use for this project are generated from qualitative information regarding changes in reproductive health laws around the world. To chart the changes in reproductive health laws, we restrict our sources to what we consider seminal catalogues of reproductive health laws around the world. Data for the abortion law index is generated from information regarding abortion laws around the world as summarized by the United Nations Population Division (United Nations Population Division 2002). The data for the contraceptive laws comes from the Tufts School of Law and Diplomacy Law and Population Program (Stepan and Kellogg 1974) and the Annual Population Review. Data for the voluntary sterilization laws comes from publications by Stepan and Kellogg (1974), Ross, Hong and Huber (1985) and Boland (2002). Below we discuss in detail the construction of the reproductive health laws index that details changes in the various reproductive health laws.

We use reproductive laws as an instrument for fertility in the female labor force equation. To be upfront, it could be argued that laws and policies are potentially endogenous, and not random treatments, makes it difficult to assess their effects on fertility. However, we argue that the timing of legal changes is discrete and random, while social change is continuous. For example, Romer and Romer (1989; 1994) argue that while monetary policy is endogenous, the willingness of the Federal Reserve to deliberately aim to generate a fall in output in order to reduce inflation, and the inflation threshold that produces this response, is not fixed and mechanical but the result of the personalities involved and the deliberative process. Such episodes therefore can be considered as random policy shocks whose effects can be used to make inferences on the impact of monetary policy. We argue that changes in abortion and contraceptive laws have similar characteristics.

As further support for the randomness of the timing of changes in the reproductive health laws, we consider a countries motivation for legal changes within a country are driven more by the event of international conventions (the United Nations International

Conference on Population and Development in Cairo, 1994) than by on-going social forces that equally effect female labor force participation and reproductive health laws.

A final point about our instruments is that we treat the estimates as identifying a single effect of fertility on female labor force participation. If there is heterogeneity in the response across women, and abortion and contraceptive legislation only affects the fertility of a specific subgroup of the population, it is the average labor market response to fertility within this subgroup that we measure, not the population average response (Imbens and Angrist 1994). Thus we employ a series of stratifications to tease out this heterogeneity.

We stratify by urban and rural living women. The prior is that women in rural areas may be more likely to work on their own or family land and thus potentially have a greater opportunity to conduct work and childcare simultaneously compared to their urban-living counterparts. Referring to Table 1, we first stratify by urban/rural living. In descriptive analysis of the nature of work within the DHS sample, we find that rural women are more likely than urban women to be active in the workforce. Of those women who work, rural women are also more likely to work for a family member, rural women are more likely to have seasonal work throughout the year rather than work all year long as urban women are more likely to do, and rural women are more likely to work for in-kind remuneration than for cash.

We also stratify by age, grouping younger women who are more likely to have children under the age of five in one group and women over the age of 33 in the other group. Refer to Table 2. The idea behind these groupings is that the younger women are more likely to use abortion and contraception to control the timing of their births, and older women more likely to want to avoid births and thus may be acceptors of sterilization more than contraception.

Taking full advantage of the large sample sizes within the DHS, we then stratify by religion: Muslim, all Christian, Catholic only, and other religion. This takes account of

the historical variation in attitudes towards family planning across the different religions.

In Table 2 summary statistics of the number of children between the ages of zero and four are presented. For women between the ages of 18 and 32, urban women have fewer children between the ages of zero and four than do their rural compatriots. For women between the ages of 33 and 49, again urban women have fewer young children. However, across both urban and rural, women between the ages of 33 and 49 have fewer young children than women between the ages of 18 and 32.

Abortion Laws

To construct the abortion law index we use information on national abortion legislation compiled by the United Nations Population Division (United Nations Population Division 2002). The data contain detailed information on the legality of abortion over time. We use the United Nations' system to classify current laws. This system classifies seven legal reasons for an abortion: to save the life of the woman; to preserve her physical health; to preserve her mental health; consequent on rape or incest; fetal impairment; economic or social reasons; and available on request. Our data contain indicator variables for each of these seven categories. A "1" indicates that abortion is available for the given reason, and "0" means that it is not. When an abortion is available on request, we assume availability for any of the other reasons if this is not explicitly stated.

Although these categories are broad, they are not comprehensive descriptions of abortion law. There are frequently cutoffs for lawful abortions depending on the length of the pregnancy. The mechanisms for adjudicating if a pregnancy meets a particular criterion differ across countries, relying in some cases on a single doctor, while in others two or more doctors are required to agree. In some countries a husband's consent is required. The United Nations coding scheme ignores these additional factors and declares an abortion for a particular reason lawful if it is allowed at any time during the

pregnancy. In federal systems, abortion laws sometimes differ across regions within a country. In this case the law that covers the majority of the population, if one exists, is used to classify at the national level.

In many countries there is a divergence between law and practice, with abortions being widely available despite being technically illegal, or vice versa. We code according to the law in place rather than its enforcement or the practical availability of abortion.

Worldwide abortion is a common method of ending a pregnancy (Henshaw, Singh and Haas 1999), also in developing countries (Anarfi 2003), and thus has the potential to influence fertility.

For abortion legislation to be a valid instrument for fertility it must be uncorrelated with the error term in the female labor force participation regression. There are two ways instrument validity may break down. The first is if abortion laws affect female labor supply directly, and not via their effect on fertility. This seems unlikely. A more worrying issue is that abortion legislation is endogenous and responding to social factors that also influence fertility and female labor force participation.

The precise timing of changes to abortion laws random, the overall level of the law may reflect social forces. Beasley and Case (2000) advocate using fixed effects in this case to control for differences between countries in these social factors. It follows that in this case we identify the effect from abortion legislation that *deviates* from the global average level and trend of social forces. Although the level and time trend in abortion legislation may be endogenous, we take the exact timing of abortion legislation that generates deviations from these long-term trends to be random.

Contraceptive Laws

The contraceptive (pill, condom, and IUD) data is sourced from the Law and Population Monograph Series (Stepan and Kellogg 1974) published by the Fletcher School of Law

and Diplomacy at Tufts University. Efforts to collate the contraceptive laws around the world were then taken over by Annual Population Review at Harvard Law School in 1976 when the Tufts Law and Population Programme was discontinued. The Annual Population Review is now hosted at Harvard School of Public Health.

In the 1974 publication, the collation of data on the contraceptive laws around the world is comprehensive and systematic. Categories detailing legality of import, manufacturing, sale, and advertising of the pill, condom and IUD are outlined for over 60 countries. Information collected from 1974 in the Annual Population Review is in a different format, with short excerpts from legal documents giving details of any changes to the law relating to contraception. The 1974 source offers a standardized reference point, with information often going back to 1920. Information regarding changes in the laws after 1974 is collated from the Annual Population Review which is a summary of legal documentation from the relevant countries.

One of the key distinctions made in the legal data is the availability of the pill and condom as a contraceptive versus a prophylactic. Thus information from other sources may indicate that contraception is available, it may be that it is just available as a prophylactic and not as a contraceptive. We take information from the laws *de jure*, rather than considering actual access and use, and thus there may be disparities between use and the law.

To identify variation in the laws across time and across countries, different categories of legality for the pill, condom and IUD were applied. For the pill there are five categories for legality: sale purpose, sale location, prescription requirement, subsidy, commercial advertising. For the condom, few categories are applied: sale purpose, subsidy, commercial advertising. For IUD there are just two categories: legal, and physician requirement of installation.

In Table 3 an outline of the indexation of the laws is provided and details of each sub-category of listed. More liberal states of the world are associated with higher index

values. For the pill, the most liberal state would imply an index value of 13, for the condom 9 and for IUD 4.

Voluntary Sterilization

Information regarding the voluntary sterilization laws are taken from two principal sources (Ross, Hong and Huber 1985; Boland 2002). In this case the coding is for legality or not, but it is multinomial across four categories: a value of "1" if voluntary sterilization is illegal; a value of "2" if it is permitted for therapeutic, eugenic, medical or health reasons only; a value of "3" if the legal status is unclear; and a value of "4" if permitted for contraceptive purposes. In many developing countries, the legal status of voluntary sterilization is unclear. In this case, we consider that sterilization will be available, since it is not illegal, but it will not be promoted and thus ranks lower than the case when it is legal for contraceptive purposes.

Model for estimation

In this analysis we exploit the variation over time within a country across reproductive health laws, fertility and female labor force participation. With this general fixed effects approach, we require country characteristics to vary across time. Countries with only one DHS survey, or countries whose reproductive health laws did not vary over time are dropped from the sample. The list of countries that remain in the sample are listed in Table 4.

The individual is a woman between the ages of 18 and 49. We model the extensive margin of female labor force participation with an indicator that she is active in the workforce or not. This is then modeled to depend on the number of children she has between the age of zero (newborn) and five, the number of children she has between the age of five and 15. We also control for her level of education. We include age dummies so that the mean labor force participation can vary at each age. We also include year time trend and country dummies.

Thus the basic model takes the form,

$$active_{iajt} = \beta_0 + \beta_1 C_{05} + \beta_2 C_{515} + \beta_3 E + \beta_{4a} age_a + \beta_5 year_t + \beta_{6j} country_j + \varepsilon_{iajt} \quad (1.1)$$

Where *C* is the variable for infants of the two age bands (0-5 and 5-15) and *E* is education of the respondent. The variables vary across respondent *i* who is age *a* in country *j* in year *t*.

To identify the effect of infants on female labor force participation, we distinguish between the age groups of children. Young children, who are less that the age of five are time intensive to care for and schooling of somesort typically begins after the age of five. Whereas children who are older (5-15) will be less time intensive to care for, but they will be potentially expensive. Fewer children in this age group who are attend school and are more independent from their parents frees up time for women to work. Contrary to this, with more children in this age group school fees, clothing, food and shelter will become more expensive and potentially force women to work to fund these expenses. Thus we may expect a negative coefficient on the young children and an ambiguous outcome on the older children. In this analysis we treat the younger children as endogenous to the labor supply decision, but the older children to be exogenous to current labor supply decisions. Another way to interpret the exogeneity of the older children is to consider that it is impossible for current work decisions to affect fertility that occurred at least five years previous. This assumes that any serial correlation in the fertility/labor supply decision becomes negligible after five years.

We expect the education of the mother to have a positive effect on the probability of working. More highly educated women will be more likely to work as the skills they gained through education will attract higher wages in the workforce.

The choice of instrumental variable for this study comes from reproductive health laws as explained above. To construct the index the first principal component of each of the indexation values on the reproductive health laws six years prior to the interview is

taken to explain births over the past five years. The six years is assumed to give time for the decision and gestation period.

We estimate the above equation and report the results in tables in the appendix with a discussion of results in the next section.

Results

Table 5 summary statistics are presented. A little under 50 per cent of the sample is active in the workforce. On average respondents have 0.65 children between the ages of zero and four, and 1.18 children between the ages of five and 15. Women have on average 5 years of education, and are on average 31 years and as defined by restricting the sample the age ranges between 18 and 49. The surveys included in the sample range between the years 1987 and 2007.

Summary statistics for the reproductive health laws are given. The abortion law index ranges between zero and seven: countries with a value of seven have the most liberal abortion laws. The contraceptive pill index maximum is 12, thus no country reaches the potential maximum of 13. The condom index reaches the maximum possible of nine. The average IUD index is 2.96, and the voluntary sterilization index average across the sample is 3.54. The reproductive health index is the first principal component of abortion, pill, condom, IUD and sterilization indices.

In Table 6 the correlation matrix is presented. The reproductive health index, the first principal component, has a correlation between 0.52 and 0.86 with each of the individual indices. The reproductive health index is negatively correlated with the number of children alive between the ages of zero and four.

In Table 7 the ordinary least squares estimation of the reproductive health law index on the number of children alive between the ages of zero and four is presented. In column three, with the inclusion of education of the respondent as a control variable, the

estimation indicates that women between the ages of 18 and 49 experience lower fertility when reproductive health laws are more liberal. The reproductive health index is the first principal component of each of abortion, pill, condom, IUD and sterilization indices. Increasing the reproductive health index by one standard deviation implies that the number of children between the ages of zero and four would decline by 0.06 – for example a decline from of 0.65 children to 0.59 to take the mean number of children between the ages of zero and four as a benchmark.

In Table 8 the fixed effects estimates of fertility on female labor force participation is presented. In urban areas (refer to column (3)) women with one more child between the ages of zero and four are 4.5 percent less likely to work. For women in rural areas, see column (4), the relationship between fertility and female labor force participation is weaker than for those in urban areas, but still a higher number of children between the ages of zero and four is associated with lower female labor force participation.

In Table 9 the two-stage least squares estimates are presented. In this analysis, it is reasonable to expect that there is simultaneity in the fertility and labor supply decisions. Thus to control for potential reverse causality, that is labor supply decisions affecting fertility decision, an instrumental variable approach is applied. In this case of endogeneity of fertility in the labor supply equation, we would expect IV co-efficient to be smaller than the OLS estimated co-efficient. One reason for observing higher IV coefficients than the OLS coefficients is that measurement error may attenuate the OLS co-efficient. If there is a systematic error in measuring the number of children alive between the ages of zero and four, and this systematic error is related to the error term, then the co-efficient on the number of children will be too small when estimated using ordinary least squares. While it is known that respondents are not accurate with their recall of children who have died, of the children who are alive systematic measurement error is not expected. One further explanation for the OLS estimates being smaller than the IV estimates is that omitted variable bias may be at work. If there is an inverse relationship between the number of children aged zero to four and the omitted variable, and the true coefficient on the omitted variable is positive, then the OLS estimate will

be too small. For the instrumental variable to not confound the bias caused by the omitted variable, then it must be the case that the only channel by which the reproductive health law affects female labor force participation is through fertility.

In the 2SLS results, the coefficient on the number of children alive between the ages of zero and four is very large: reducing the number of children by one, implies that the respondent is 100 percent more likely to participate in the labor force.

Using the instrumental variable approach, we capture an average treatment effect of those women who change their fertility decisions because of a change in the law. While we have already permitted heterogeneity between rural and urban women, expecting women who live in urban areas to be more affected by legal changes than rural women, we may also expect the heterogeneity in the average treatment effect across age groups of women and religion. Instrumental variables allow us to infer a causal effect among a subset of the population – the subset being those affected by the instrument. Given the variability amongst religions on their historical attitudes towards reproductive health (Potts, Diggory and Peel 1977) we may expect that the average treatment of the instrument to differ across religion. We may also expect the use of abortion, contraception and sterilization to differ for younger women in their prime fertile years to older women. For younger women, reproductive health laws that facilitate the timing and spacing of births may be more relevant than reproductive health laws designed to eliminate fecundity (as in sterilization). The latter may be favored by women who have completed their desired fertility. Thus, to capture this possible heterogeneity, we stratify by age group and then by religion.

In Table 10 we present the first stage by age and by urban/rural residence. For women who are between the ages of 18 and 33, liberalization of the reproductive health law is associated with a decline in fertility. For older women, there is a perverse positive response: more liberal laws associated with more children aged between zero and five. Rather than justifying the positive relationship, it is likely that this relationship is

spurious, and that for older women reproductive health laws have no bearing on their fertility outcomes.

In Table 11 the fixed effects estimates are presented. These results suggest a relatively consistent relationship between fertility and female labor force participation across the ages. In urban and rural and for each age group, a higher number of children are associated with lower workforce participation.

In Table 12 the two-stage least squares estimates are presented. For young, urban women each extra child means that she is 27 percent less likely to work. For young rural women, the co-efficient is large – for each extra child she will reduce work by 100 percent. For older women, the relationship between fertility and female labor force participation becomes positive. The counterintuitive sign and the implausible magnitudes would indicate that the reproductive health laws instrument is not valid for these women.

Given the breadth of the DHS sample, we exploit a further stratification. As there may be a heterogenous relationship fertility and female labor force participation across age groups, there may also be heterogeneity by religion.

In Table 14 the two-stage least squares results of the effect of fertility on female labor force participation is presented. By stratifying by religion, it becomes obvious that the main result presented in Table 12 is driven by those who identify with a religion other than Muslim or Christian (including Catholic). Thus it would appear that the reproductive health laws had a bearing on fertility decision and labor force participation outcomes for young, urban women who are not Muslim or Christian.

Conclusion

In this paper we have explored the causal effect of fertility changes on female labor force participation focusing on the developing country context. To identify the causal

effect of fertility on female labor force participation, we develop an instrumental variable that details historical legal changes in abortion, contraceptive pill, condom, IUD and voluntary sterilization laws between 1960 and the present. Given the nature of the instrumental variable, we considered the treatment effect of the instrument and stratified our sample by age group, urban/rural living and by religion. We found that across the different stratified groups, that the treatment effect was heterogeneous. Using the instrumental variable approach we found for women between the ages of 18 and 33 living in urban areas the effect of fertility decline had an effect of a 27 percent decline on female labor force participation. When stratifying by religion, we found that this result was predominantly driven by individuals who reported not to be Muslim or Christian and identified with no, or another, religion.

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Table 1: The Nature of Female Labor Force Participation in the Demographic and Health Survey

			18-33 year olds		33-49 year olds	
		All	**Urban**	**Rural**	**Urban**	**Rural**
Active (v714)	N	811,092	195,780	240,647	139,878	167,426
	active	47.6	39.6	47.14	50.73	57.71
Work for…(v719)	N	327,543	67,181	109,549	56,262	89,450
	work for family member	24.61	11.09	34.09	10.18	32.24
	work for someone else	30.13	44.45	22.82	38.89	23.16
	self employed	45.24	44.44	43.08	50.91	44.58
Work place…(v721)	N	359,201	83,170	109,421	70,737	90,077
	work at home	24.51	25.08	23.67	27.89	22.3
	work away from home	75.49	74.92	76.33	72.11	77.7
Worked in the past 12 months (v731)	N	547,630	144,820	169,734	105,326	119,480
	no	44.37	51.53	45.54	42.89	35.7
	in the past year	5.35	7.07	5.39	4.07	4.41
	currently working	50.1	41.23	48.83	52.9	59.69
	on leave	0.19	0.17	0.24	0.14	0.2
Seasonal work…(v732)	N	277,095	58,825	90,320	49,195	74,345
	works all year round	64.53	71.44	55.62	79.04	60.13
	works seasonally	26.98	17.05	35.69	13.19	33.43
	works occationally	8.45	11.41	8.67	7.74	6.43
For those in the Ag sector, work on…(v740)	N	90,490	3,574	43,957	3,769	37,494
	own land	40.69	27.5	36.69	36.19	46.56
	family land	36.28	40.88	42.06	28.5	30.19
	someone else's land	16.2	23.22	14.58	26.74	16.48
	rented land	6	7.81	5.79	8.09	5.92
Type of earnings (v741)	N	204,775	48,647	59,967	42,296	50,290
	no paid	19.38	7.55	29.49	6.74	29.34
	cash only	61.45	83.5	42.75	84.82	42.88
	cash and kind	13.2	7.38	17.75	7.08	18.48
	in kind only	5.97	1.57	10.01	1.36	9.3

Notes: The initial sample is based on the sample used in the regression analysis. Sample sizes relate to the number of respondents who were asked and/or responded to the relevant question. Values against the variable response are the fraction of respondents within the sub-sample (eg urban women aged 18-33 who responded to question v741).

Table 2: Fertility by age and urban/rural

Chilren alive aged 0-5					
		18-33 year olds		**33-49 year olds**	
	All	**Urban**	**Rural**	**Urban**	**Rural**
Observations	811,092	195,780	240,647	139,878	167,426
Mean	0.65	0.69	0.96	0.30	0.45
Standard deviation	0.80	0.79	0.84	0.59	0.72
Minimum	0	0	0	0	0
Maximum	5	5	5	5	5

Table 3: Indexation of Reproductive Health Laws

Pill	Indexation Value	Sale Purpose	Sale Location	Prescription Requirement	Subsidy	Commercial Advertising
	1	Illegal	Pharmacy	Prescription Required	Commercially available	Illegal
	2	Non-contraceptive	Shop	Prescritpion not required	Subsidy	Legal with restrictions (including RH education)
	3	Contaceptive			Free	Legal

Condom	Indexation Value	Sale Purpose	Subsidy	Commercial Advertising
	1	Illegal	Commercial	Illegal
	2	Non-contraceptive	Subsidized	Legal with restrictions (including RH education)
	3	Contraceptive	Free	Legal

IUD	Indexation Value	Legal	Physician requirement
	0		if previous question stated illegal
	1	Illegal	Doctor only inserts
	2	Legal	Doctor or other inserts

Table 4: Country list

Country Name	Frequency	Percent	Cumulative percent
Bangladesh	10,413	1.28	1.28
Benin	26,345	3.25	4.53
Brazil	21,379	2.64	7.17
Burkina Faso	21,674	2.67	9.84
Burundi	3,534	0.44	10.28
Cameroon	17,074	2.11	12.38
Colombia	65,774	8.11	20.49
Cote d'Ivoire	9,424	1.16	21.65
Ghana	13,412	1.65	23.31
Guinea	12,836	1.58	24.89
India	283,802	34.99	59.88
Indonesia	63,377	7.81	67.69
Kenya	26,610	3.28	70.97
Mali	2,911	0.36	71.33
Mexico	7,293	0.9	72.23
Niger	20,024	2.47	74.7
Nigeria	13,634	1.68	76.38
Pakistan	16,263	2.01	78.39
Peru	67,329	8.3	86.69
Philippines	36,962	4.56	91.24
Senegal	28,901	3.56	94.81
Thailand	6,663	0.82	95.63
Turkey	21,943	2.71	98.33
Uganda	13,515	1.67	100
Total	811,092	100	

Table 5: Summary Statistics

	Mean	Standard Deviation	Minumum	Maximum
Active	0.48	0.50	0	9
Children alive aged 0-4	0.65	0.80	0	6
RH Index	0.06	1.62	-3.86	2.49
Children alive aged 5-15	1.18	1.33	0	9
Education of the respondent	5.08	4.91	0	99
Age of the Respondent	31	9	18	49
Survey year	1998	6	1986	2007
Abortion index	3.49	2.26	0	7
Pill index	9.51	1.52	6	12
Condom index	6.46	1.34	4	9
IUD index	2.96	0.72	1	4
Sterilization index	3.54	0.69	2	4

Based on a sample of 811,092 observations consistent with the two-stage least squares sample not stratified by age group or urbanicity.

Table 6: Correlation Matrix

	Active	Children alive aged 0-4	RH Index	Children alive aged 5-15	Education of the respondent	Age of the Respondent	Survey year	Abortion index	Pill index	Condom index	IUD index
Active	1.00										
Children alive aged 0-4	-0.04	1.00									
RH Index	-0.16	-0.07	1.00								
Children alive aged 5-15	0.08	0.10	-0.03	1.00							
Education of the respondent	-0.05	-0.14	0.06	-0.25	1.00						
Age of the Respondent	0.12	-0.27	0.03	0.34	-0.14	1.00					
Survey year	0.05	-0.05	0.33	-0.05	0.06	0.01	1.00				
Abortion index	-0.13	-0.07	0.52	-0.02	-0.06	0.00	0.14	1.00			
Pill index	-0.14	-0.07	0.86	-0.03	0.06	0.02	0.35	0.50	1.00		
Condom index	-0.08	-0.05	0.82	-0.03	0.09	0.02	0.31	0.14	0.66	1.00	
IUD index	-0.11	-0.03	0.54	-0.01	0.12	0.03	0.06	-0.08	0.44	0.33	1.00
Sterilization index	-0.13	-0.04	0.75	-0.01	-0.02	0.01	0.23	0.41	0.38	0.57	0.28

Table 7: First stage stratified by urban/rural

	(1)	(2)	(3)	(4)
Dependent Variable: Children alive aged 0-4				
	Urban	Rural	Urban	Rural
RH Index	-0.0412***	-0.0217***	-0.0352***	-0.0167***
	(0.00445)	(0.00418)	(0.00417)	(0.00399)
Children alive aged 5-15	0.0512***	0.0794***	0.0309***	0.0709***
	(0.00155)	(0.00127)	(0.00150)	(0.00126)
Education of the respondent			-0.0188***	-0.0174***
			(0.000314)	(0.000406)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	357362	455296	357160	455022
R-squared	0.178	0.222	0.191	0.228

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
age restricted to 18-49

Table 8: Fixed effects estimation: the effect of fertility on female labor force participation

	(1)	(2)	(3)	(4)
Dependent Variable: Active in the workforce				
	Urban	Rural	Urban	Rural
Children alive aged 0-4	-0.0498***	-0.0291***	-0.0446***	-0.0300***
	(0.000939)	(0.000765)	(0.000938)	(0.000767)
Children alive aged 5-15	-0.0159***	-0.00208***	-0.00958***	-0.00296***
	(0.000609)	(0.000524)	(0.000600)	(0.000510)
Education of the respondent			0.00678***	-0.00224***
			(0.000203)	(0.000274)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	655347	856308	654929	855774
R-squared	0.154	0.188	0.157	0.188

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
age restricted to 18-49

Table 9: Two-stage least squares: The effect of fertility on female labor force participation

	(1)	(2)	(3)	(4)
Dependent Variable: Active in the workforce				
	Urban	Rural	Urban	Rural
Children alive aged 0-4	-0.448***	-1.676***	-0.498***	-2.439***
	(0.0922)	(0.385)	(0.110)	(0.650)
Children alive aged 5-15	0.0101**	0.142***	0.00599	0.176***
	(0.00506)	(0.0318)	(0.00368)	(0.0475)
Education of the respondent			-0.00622***	-0.0562***
			(0.00220)	(0.0127)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	340991	414446	340790	414172
Cragg-Donald F	209.5	63.65	150.8	34.87

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
age restricted to 18-49

Table 10: First stage by age group and urban/rural. The effect of the reproductive health laws on the number of children alive between the ages of 0 and 4.

	(1)	(2)	(3)	(4)
Dependent Variable: Children alive aged 0-4				
	18-33 year olds		**33-49 year olds**	
	Urban	**Rural**	**Urban**	**Rural**
Reproductive Health Laws Index	-0.0832***	-0.0548***	0.0150***	0.0154***
	(0.00613)	(0.00556)	(0.00458)	(0.00470)
Children alive aged 5-15	0.0217***	0.0217***	0.0974***	0.145***
	(0.00260)	(0.00236)	(0.00145)	(0.00127)
Education of the respondent	-0.0311***	-0.0251***	0.00190***	-0.00106**
	(0.000520)	(0.000571)	(0.000313)	(0.000468)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	203,734	260,960	147,975	187,199
R-squared	0.069	0.041	0.122	0.188

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11: Fixed effects estimation by age group and urban/rural. The effect of fertility on female labor force participation.

	(1)	(2)	(3)	(4)
Dependent Variable: Active in the workforce				
	18-33 year olds		**33-49 year olds**	
	Urban	**Rural**	**Urban**	**Rural**
Children alive aged 0-4	-0.0331***	-0.0212***	-0.0392***	-0.0298***
	(0.00109)	(0.000897)	(0.00156)	(0.00118)
Children alive aged 5-15	0.0361***	0.0290***	-0.00465***	-0.00416***
	(0.000801)	(0.000603)	(0.000746)	(0.000630)
Education of the respondent	0.00434***	-0.00451***	0.0132***	0.00403***
	(0.000248)	(0.000301)	(0.000263)	(0.000354)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	379037	498932	265925	343702
R-squared	0.102	0.181	0.177	0.178

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Two-stage least squares estimation by age group and urban/rural. The effect of fertility on female labor force participation.

	(1)	(2)	(3)	(4)
Dependent Variable: Active in the workforce				
	18-33 year olds		**33-49 year olds**	
	Urban	**Rural**	**Urban**	**Rural**
Children alive aged 0-4	-0.266***	-1.092***	0.230	2.035***
	(0.0467)	(0.182)	(0.347)	(0.596)
Children alive aged 5-15	0.0382***	0.00266	-0.0304	-0.228***
	(0.00177)	(0.00289)	(0.0338)	(0.0644)
Education of the respondent	-0.00537***	-0.0420***	0.00687***	0.0141**
	(0.00156)	(0.00529)	(0.000627)	(0.00570)
Age of the respondent dummies	yes	yes	yes	yes
Year trend	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Observations	195,780	240,647	139,878	167,426
Cragg-Donald F	366.8	107.3	13.75	21.76

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14: The effect of fertility on female labor force participation by religion

	(1)	(2)	(3)	(4)
Dependent Variable: Active in the workforce				
	18-33 year olds		**33-49 year olds**	
	Urban	**Rural**	**Urban**	**Rural**
ALL				
Children alive aged 0-5	**-0.266*** **	**-1.092*** **	**0.230**	**2.035*** **
	(0.0467)	(0.182)	(0.347)	(0.596)
Observations	195,780	240,647	139,878	167,426
Cragg-Donald F	366.8	107.3	13.75	21.76
MUSLIM				
Children alive aged 0-5	-0.129	3.287	7.354	0.743*
	(0.143)	(3.025)	(37.04)	(0.425)
Observations	41,554	60,113	27,570	40,869
Cragg-Donald F	28.11	2.000	0.0599	11.49
CHRISTIAN				
Children alive aged 0-5	-0.0290	-0.160	-0.108	-0.630**
	(0.130)	(0.170)	(0.221)	(0.289)
Observations	48,453	53,182	29,634	36,097
Cragg-Donald F	35.05	35.51	16.55	18.59
CATHOLIC				
Children alive aged 0-5	-0.152	-0.649	2.202	-0.706
	(0.238)	(0.904)	(8.001)	(0.507)
Observations	30,552	25,068	18,662	17,797
Cragg-Donald F	9.493	1.068	0.0898	3.380
OTHER				
Children alive aged 0-5	-0.389***	-0.670***	0.238	2.978**
	(0.108)	(0.131)	(0.709)	(1.167)
Observations	48,791	97,037	39,625	67,216
Cragg-Donald F	79.12	122.0	6.328	11.15

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1: Some examples of the relationship between fertility and the reproductive health laws index.