Fertility Issues in Developing Countries

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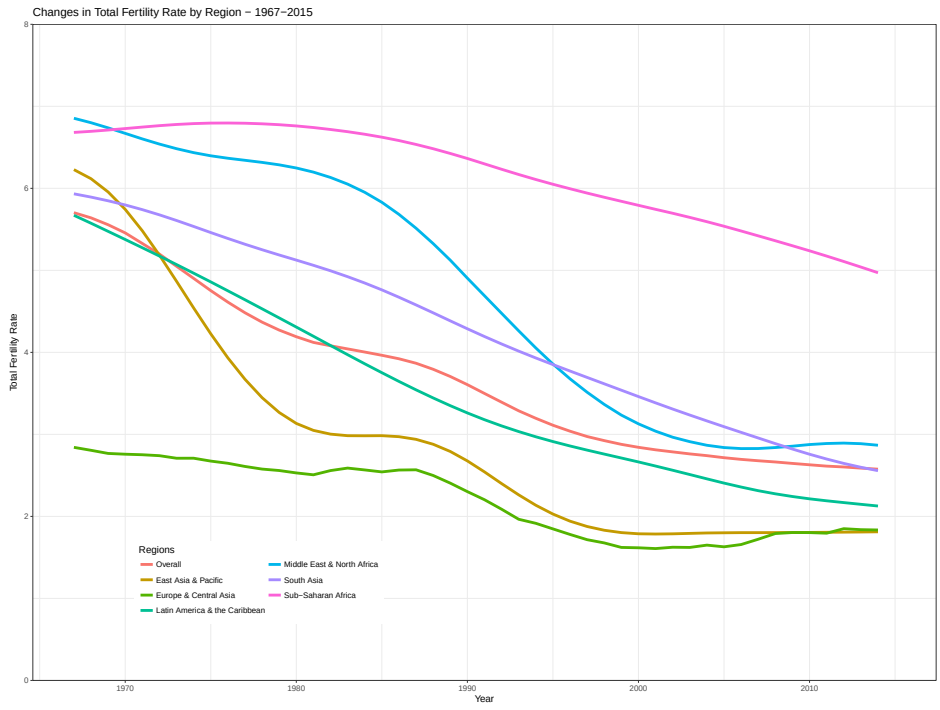
February 2017

1 Introduction

Despite a common perception that fertility is very high in developing countries, the truth is substantially more complicated. Figure 1 shows that there has been an astonishing decline in most developing countries' total fertility rate (TFR) over the last half century.[1] Half a decade ago, TFR was around 7 children, with the exception of Europe and Central Asia. The most recent data show, however, that, with the exception of Sub-Saharan African, TFR is now either below or only slightly above the replacement level of 2.1. Despite this rapid decline in fertility population size is still growing in many of these regions because there are still many more young people than older people and these young people either have not entered reproductive age or are just starting out.

Figure 1: Total Fertility Rates by Region from 1967 to 2015



If fertility levels are close to identical across developing and developed countries and there is rapid urbanization and increasing labor force participation among women do

[1] TFR is the number of children a women entering her reproductive life would have if she had children following the age-specific fertility rates observed at that point in time. Hence, it is composite or snapshot measure of current fertility behavior.

we even need a developing country version of this chapter?[2] The goal of this chapter is to highlight the areas in which a separate focus on developing countries is still relevant, what the recent developments in research has been, and most importantly, what I consider to be the main outstanding issues.

[still need policy discussion; this seems kind of a rambling list] Furthermore, we still know relatively little about determinants of timing of births in developing countries. People in most developing countries are also still subject to higher risk of shocks, be that from weather, health, or political, but we still have little idea of how people respond to the level of risk and the occurrence of shocks. Finally, both in developed and developing countries we have mostly treated fertility decisions as separate from other household decision and preferences [ehh, Becker theory!]. We still need to know more about how husband and wife decides on fertility if they are have different preferences and how allocation decisions across all household member are related to fertility decisions. A prime example that I will treat separately is the role of son preferences in fertility decisions.

2 Sub-Saharan Africa

The outlier in the figure above is Sub-Saharan Africa. Sub-Saharan Africa now has an average TFR that is about twice as large as the other regions. Most of the projected future increase in world population is therefore likely to come from Sub-Saharan Africa (Gerland, Raftery, Ševčíková, Li, Gu, Spoorenberg, Alkema, Fosdick, Chunn, Lalic, Bay, Buettner, Heilig and Wilmoth, 2014).[3] The most important issues from a policy standpoint is why the fertility decline in Sub-Saharan Africa have moved at a much slower pace than the other regions and even appears to have stalled in some countries (Ainsworth, 1996; Singh, Bankole and Darroch, Forthcoming). The purpose of this section is not to provide

[2] TK references on urbanization and labor force particpation.

[3] Currently Africa is home to about 1 billion people, but this will increase to between 3.1 and 5.7 billion by the end of the century.

the final answer, but instead to highlight both how we can think about fertility decisions and suggest possible answers.

Broadly speaking there are two competing approaches to explaining fertility decisions.[4] One sees fertility preferences as the main driver of fertility and considers preferences malleable and mainly determined by cultural factors and transmission of ideas of ideal family size across groups. Under this approach the main constraints on reaching desired fertility is the level of access to family planning and contraceptives.

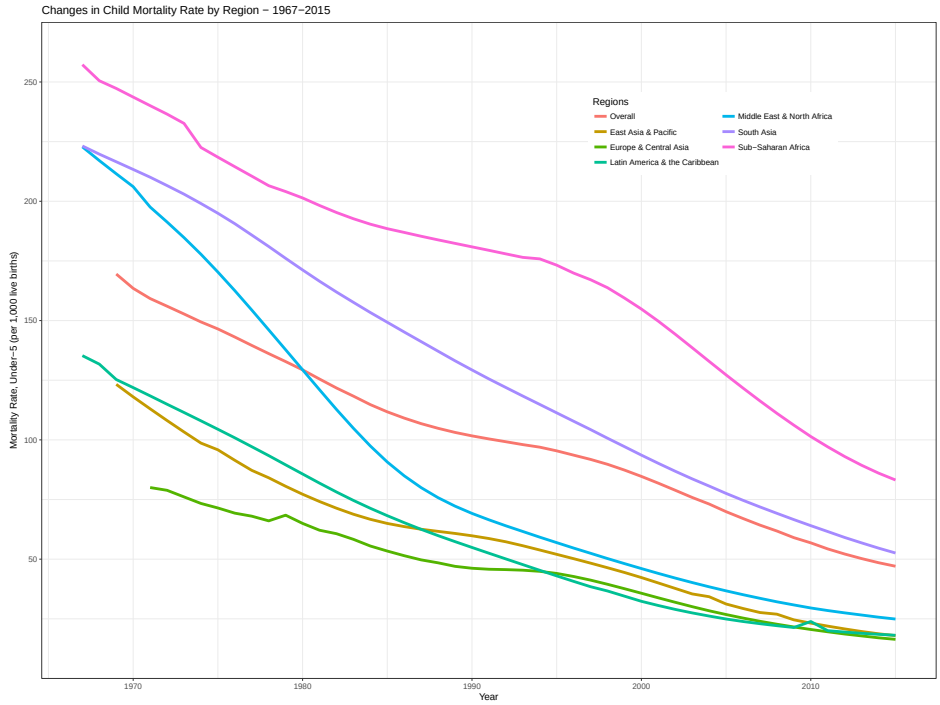
The other sees the decision on fertility as driven by the trade-off between the cost of children and the return to children, which can either be monetary or the utility of having offspring. In this approach parents are assumed to be able to control fertility even in the absence of modern contraceptives. Hence, although lower cost of preventing births—for example easier access to modern contreceptive—will still lower fertility in this approach the decline in fertility is assumed to be much smaller than the first theory.

Both theories consider the surviving number of children as the main outcome that people are interested in. One possible explanation for the slow decline in fertility could therefore be that mortality in Sub-Saharan Africa is higher than in the other regions. Figure 2 shows the development over time in under-5 mortality across the same regions as above. The improvements in mortality risk over time are truly astonishing. Over the last half-decade under-5 mortality in developing countries has fallen from close to 175 to below 50 per 1,000 live births. Sub-Saharan Africa, however, lacks substantially behind other regions. Despite a massive improvement from a situation where more than a quarter of all children born did not live to see their fifth birthday to about 80 deaths per 1,000 births, the current mortality rate is still more than three times larger than that of the other regions (with the exception of Middle East and North Africa). Although mortality is likely part of the explanation it cannot be the full explanation. Mortality in Sub-Saharan Africa is at the same level as it was in South Asia around the turn of the century, but fertility is

[4] This is clearly a simplification but it serves to illustrate the differences in approaches.

about 1.5 child higher in Sub-Saharan Africa than it was in South Asia at the turn of the century (and therefore at the same level of mortality).

Figure 2: Under-5 Mortality Rates by Region from 1967 to 2015



If mortality is not the explanation, what might lead to the higher fertility in Sub-Saharan Africa? Demographers, following the first approach described above, have argued that the two main reasons for the slow decline in fertility in Sub-Saharan Africa are the high ideal family size still in place and a substantial "unmet need" for contraception (Bongaarts and Casterline, 2013; Singh et al., Forthcoming). Contraceptive use is, indeed, lower in Sub-Saharan Africa than the other regions, but other regions managed to reduced fertility even in the absence of access to modern contraceptives Schultz (1985); Galloway (1987); Bailey and Chambers (1998); Bengtsson and Dribe (2006). Furthermore, one difference in fertility behavior between Sub-Saharan Africa and the other regions are that the longer birth intervals even in the absence of access to modern contraception, which are the result of postpartum sexual abstinence and extended periods of breastfeeding (Caldwell, Orubuloye and Caldwell, 1992). To the extend that the longer birth intervals are the

result of conscious decisions it shows that people are able to control fertility.[5]

There are three alternative explanation that may explain the slow decline. First, the relative abundance of land compared to other regions. Second, low levels of education; or at least low levels of quality in education. Finally, the role of urbanization across regions.

The effect of land access on fertility works in a couple of different way. First, there is more land per capita in Sub-Saharan Africa than in the other regions. At the median projected population growth for Sub-Saharan Africa—which is 4.2 billion people by 2100—the population density will only be roughly equal to that of China today (Gerland et al., 2014, p 235). The low density means that there is little pressure to restrain fertility for fear of running out of land. In fact, it is likely that there is a higher return to children in Sub-Saharan Africa than in the other regions—or, at least, a substantially lower cost—because the return to children working on the family farm is higher (Caldwell et al., 1992). Similarly, there are substantially higher return to having wives work on agricultural land (Jacoby, 1995). The associated polygyny also appeared to have resulted in a situation where the cost of the children where born by the individual wives, but the decision on fertility was made by the husband. I return to this point below.

A second characteristics of land in Sub-Saharan Africa that also can lead to higher fertility is that—despite its abundance—access to land rights are controlled at the local level by chiefs and other local institutions rather than through market based buying and selling of land. This is important because the main way to maintain land fertility in many places in Sub-Saharan Africa is through fallowing and with less secure land rights farmers may fallow their land for shorter periods than those with more secure rights (Goldstein and Udry, 2008).[6] The reason unsecure land rights can lead to other fertility is that land is often allocated based on the number of household members. Hence, more children,

[5] It is still possible that fertility is higher than desired because the higher cost of preventing "accidental" conceptions. This would explain why the estimated effect of access to family planning in Ethiopia shows a reduction in fertility of about one birth, which is equivalent to an approximate 20% reduction in fertility Pörtner, Beegle and Christiaensen (2014).

[6] See also Besley (1995), who discuss other investments in land that can secure property rights.

everything else equal, will increase your claim on land access. The irony here is, of course, that if everybody else follows the same strategy the result will be much higher fertility and little change in the allocation of land. For both of these potential effects of land access on fertility we, however, have little direct information on their effects and a this is one area that calls out for future research.

My second suggestion for a major factor impacting fertility in Sub-Saharan Africa is education. The standard economic model of fertility considers the opportunity cost of women's time to be the main factor affecting the number of children (Becker, 1991). As women gain more education the cost of their time, and therefore of childbearing and childrearing, increases reducing fertility and leads to better health outcomes for both women and children.[7] The better health outcomes lead to lower child mortality, which in turn further decreases fertility because fewer births are required to reach a desired number of surviving children (Ainsworth, Beegle and Nyamete, 1996). The effect of education on fertility is essentially universal, making it the main recommended way to decrease fertility (Schultz, 2002).

Fertility, however, begins to decline at higher levels of education in Sub-Saharan Africa than in other regions and the relationship between fertility and education may even be positive for low levels of education (Ainsworth et al., 1996; Benefo and Schultz, 1996; Thomas and Maluccio, 1996). Part of the problem may be the quality of education in Sub-Saharan Africa. In other words, the stated number of years of education may be worse predictor of actual human capital accumulation in Sub-Saharan Africa than other regions.

A good example of this problem is Tanzania (Galabawa, 2001; Wedgwood, 2005). Taken at face value, Tanzania has a very high reported education level. This is most likely the result of the 1974 Universal Primary Education Movement, which increased accessibility of primary education and enrollment rates. The problem is that the quality of education reportedly was very low. In addition, the crisis Tanzania experienced in

[7] It is, however, not completely clear why there is such a strong association between education and health (Thomas, Strauss and Henriques, 1991; Glewwe, 1999; Kovsted, Pörtner and Tarp, 2002)

the 1980s further lowered the quality and enrollments declined significantly. Hence, it is unclear to what extent reported education levels reflect women's actual human capital. The result is that education does not appear to have as a substantial effect on fertility in Tanzania as other found elsewhere Alam and Pörtner (2016).

The final explanation for differences in TFRs across regions is the role of urbanization. When talking about fertility and its determinants in Sub-Saharan Africa one discussion seems to be essentially absent and that is the difference between urban and rural areas. As a rule all regions have had and have higer fertility in rural areas than in urban areas. This is directly in line with what we expect. The cost of children is clearly higher in urban areas than in rural areas, even for women with the same amount of education—and therefore the same opportunity cost of time. Sub-Saharan Africa is no difference. An example is Ethiopia in 2011, where the overall TRF is 4.8, but that covers a TFR of 5.5 in rural areas and only 2.6 in urban areas (Central Statistical Agency/Ethiopia and ICF International, 2012). Part of the explanation for the lower fertility is the higher average education level of women in urban areas than in rural areas. But, even for women with the same education level fertility is lower in urban areas than in rural areas (Ainsworth et al., 1996).

There has, however, not been a systematic examination of how fertility varies with education in urban areas across different regions. If predicted fertility is similar across regions for the same level of education that would suggest that Sub-Saharan Africa is not inherently different. A lower "return" to education could either be an indication that the quality of education is lower, that the opportunity cost increases with higher education is not as high in Sub-Saharan Africa as in other areas (either because of the lower quality or because of lower levels of development), or it could suggest that there is something inherently different in what determines fertility in Sub-Saharan Africa than in other regions.

3 Timing of Fertility

Newman and McCulloch (1984); Newman (1988)

How couple time their births is interesting both because it provides us with an idea of how good people are at controlling their fertility and because timing of births may impact the health of both mother and children. We know, however, surprisingly little about what determines the timing of births in developing countries. Especially with more and more women entering the labor force in developing countries, understanding how timing decisions are made will be important for the design of suitable policies. The lack of research is partly because of data limitations and partly because of the difficulty in identifying the causal relationship between timing and other decisions, such as labor supply.

The three sub-areas where we do have some information is the timing of first birth, how births respond to shocks, and how the sex of the last child affect timing of the next birth. This section covers the timing of first birth and leaves the two other areas for the sections below.

Having your first birth earlier in life is generally associated with lower educational attainment, higher completed fertility, and worse health and labor outcomes. This is, however, not necessarily indicative of a causal relationship between earlier first birth and the other outcomes. A woman who, for example, has a lower expected return to education may decide that using contraceptive is not worth the cost and therefore would be more likely to conceive and subsequently drop out of school. Furthermore, as long as fertility is well below natural fertility levels having an earlier birth will not, in itself, increase your fertility.[8]

For this reason most of the literature has focused mainly on what determines the timing of first births—and to some extent on whether women are more likely to drop out of school after their first birth. In the relatively small literature on timing of first births there are two main approaches to trying to identify whether a causal relationship exists

[8] TK Need to describe natural fertility.

between timing of first birth and other outcomes. One is to look for variables that can be argued to only affect one of the other, with no direct effect on the other outcomes, and jointly estimate the various decisions.[9]

Marchetta and Sahn (2016): number of completed grades among young women is important in delaying marriage and first birth, with the latter mainly through the delay in marriage. More education also leads to earlier entrance into the labor market. [cannot tell us anything about end fertility]

The other approach is experimental where researchers randomly access to a program that is believe to influence one of decisions and then examine whether the timing of births and the other outcomes are affected by the program.

Duflo, Dupas and Kremer (2015)

Dupas, Huillery and Seban (2017)

Ozler work on Malawi

The downside of both approaches is that we cannot learn much about what completed fertility is going to look like. Even experiments that follow people for an extended period, like the seven years in Duflo et al. (2015), only gets to the beginning of the prime childbearing years, 20 to 30.

Wolpin (1984)

4 Risk and Insurance

[treat mortality in general as a shock here? Olsen (1980)]

One of the defining characteristics of developing countries is that risk to life and livelihood are most more prevalent and less well insured against compared to developed countries. We can split the fertility response to this fact into two categories: how people respond to the shocks and how people respond to the underlying risk of experiencing a

[9] This approach is often combined with restrictions on the correlation of error terms across decisions

shock. This distinction is important because it is possible that the responses run in opposite directions, which may result in no apparent response to shocks if the underlying risk is not controlled for, or a focus on treating the shock rather than the underlying risk if both move in the same direction.

[shock response]

Hernández-Julián, Mansour and Peters (2014)

Burlando (2014) on power outage in Zanzibar

(Nobles, Frankenberg and Thomas, 2015) on fertility response to the tsunami.

(Alam and Pörtner, 2016)

Pitt and Sigle (1998)

[response to the underlying risk]

Gone with the wind?

(Lambert and Rossi, 2016) on sons as widowhood insurance

(Adsera and Menendez, 2011)

5 Intrahousehold Allocation

Sub-Saharan Africa as a special case. The father bears less of the cost of children than in other places because of the family structure. This is especially the case for West Africa (Caldwell et al., 1992).

Schultz paper on Thailand?

Ashraf, Field and Lee (2014)

(Rasul, 2008)

(Field, Molitor, Schoonbroodt and Tertilt, 2016)

An especially important aspect of intrahousehold allocation is the preference for children of a specific sex. The most dominant version is a strong preference for sons in many countries; most notably in India and China. There are obviously many different ways that

a preference for sons can manifest itself, but I will mainly be concerned with the preferences for specific numbers. The literature is somewhat fuzzy on what exactly constitutes son preference. One popular version is that for their ideal number of children, parents would prefer to have more sons than daughters, and the strength of son preference is then measured by how many more sons than daughters a family wants. This measure of son preference is commonly used in the literature (Clark, 2000; Jensen and Oster, 2009; Hu and Schlosser, 2015, See, for example,).

Before the advent of prenatal sex determination, most research focused on the impact of son preference on fertility decision and spacing between births. This literature shows clearly that before sex-selective abortions became widespread families were more likely to stop childbearing after the birth of a son than after the birth of a daughter (see, for example, Das, 1987; Arnold, 1997; Clark, 2000).[10] Furthermore, in the absence of sex-selective abortions, son preference often leads to a shorter duration until the next birth if the previous birth was a daughter (see, for example, Das, 1987; Rahman and DaVanzo, 1993; Pong, 1994; Haughton and Haughton, 1996; Arnold, 1997). The resulting shorter spacing is thought to be associated with worse health outcomes for the girls (Arnold, Choe and Roy, 1998; Whitworth and Stephenson, 2002; Rutstein, 2005; Conde-Agudelo, Rosas-Bermúdez and Kafury-Goeta, 2006). There is also evidence that girls were under-reported in China as a result of strong son preference combined with the one-child policy (Merli and Raftery, 2000).

It is easy to see how declining fertility may increase use of sex selection. Take a family that wants one son. If the family is willing to have up to 4 children, the probability of having a son is more than 94 percent, even without sex selection, and that increases to almost 99 percent if the family is willing to have up to 6 children.[11] If the desire is instead for one son *and* a maximum of two children, there is a 24 percent chance that the family

[10] Filmer, Friedman and Schady (2009) analyse the relationship between the sex composition of previous children and subsequent fertility behavior using data from 64 countries.

[11] The probability of not having a son are 48.8 percent for one child, 23.8 percent for two children, 11.6 percent for 3 children, 5.7 percent for 4 children, 2.8 percent for 5 children, and 1.4 percent for 6 children.

will have to resort to sex selection to achieve both targets. Despite these opposite targets, there is little empirical analysis of the effects of fertility on sex selection using individual level data (Park and Cho, 1995; Ebenstein, 2011).

Dharmalingam, Rajan and Morgan (2014) examine how state level fertility in India relates to desired family size and son preference over time, but does not look at how fertility preferences shape the decision on sex-selective abortions. At country level Bongaarts (2013) shows how sex ratios at births are only elevated for countries with lower fertility and Bongaarts and Guilmoto (2015) use national level estimates of the relationship between sex ratio at birth and fertility as part of their prediction of the number of missing women past and present. Simulations suggest that in Korea introduction of sex selection changed family size little, but did result in abortions of female fetuses equal to about 5 percent of actual female births (Park and Cho, 1995). For China allowing a three-child policy has been predicted to increase the fertility rate by 35 percent, but also reduce the number of girls aborted by 56 percent (Ebenstein, 2011).

[minimum number of sons instead]

Recent research suggests, however, that son preference in India, when measured as ideally having more boys than girls, is decreasing over time and with higher education (Bhat and Zavier, 2003; Pande and Astone, 2007).

my sex selection paper on India

Applied Economics paper

Absence of sex selection in Turkey Altindag (2016)

bargaining power and sex of children in China Li and Wu (2011)

6 Policies

Even though most people automatically think of family planning program when population policy is mentioned, any policy that changes the opportunity cost of time or af-

fects the distribution of bargaining power within the household will affect fertility. I will therefore cover both standard family planning programs and other policies that impact fertility.

Despite a substantial and long-standing interest in the effectiveness of family planning programs there is relatively little convincing empirical evidence.[12] The lack of evidence is mainly the result of the challenges in measuring family planning program's impacts. First, studies of family planning programs have often covered periods of rapid economic development and fertility decline, making it difficult to isolate the effects of family planning programs from the changes in the economy. Second, existing studies have largely ignored heterogeneous impacts, especially whether women with different education levels respond differently to family planning. Evidence from the US shows that better-educated women and less-educated women are equally efficient users of modern contraceptives, but better-educated women are more efficient at using "ineffective" contraceptive methods such as withdrawal or rhythm (Rosenzweig and Schultz, 1989). This suggests that the effect of family planning should be stronger the lower the education levels, but few studies address this. Finally, rigorous study is hampered by the challenge of non-random program placement (Rosenzweig and Wolpin, 1986; Pitt, Rosenzweig and Gibbons, 1993).

Randomizing the allocation of programs and comparing the outcomes of interest between treatment and control areas could overcome the non-random program placement problem. Although theoretically superior, such experiments have several drawbacks in practice. First, there are concerns about the external validity of experiments, which are often small in scale. Add to this, non-compliance of randomization can further decrease the power of the experiment (Desai and Tarozzi, 2011). This is especially a problem for programs like family planning where the randomization takes places at community level

[12] For a more in-depth discussion of both the history of family planning programs and the literature see Miller and Babiarz (2016). An older review of the literature, focusing on whether access to family planning changes preferences for number of children is in Freedman (1997). Singh and Darroch (2012) provide recent estimates of the use and need for contraceptives in the developing world, together with cost of providing contraceptive services.

rather than at individual level. Second, because of the cumulative nature of fertility, an experiment must run for a substantial period before one can assess the effect on fertility. This is, for example, a likely explanation for the absence of an increase in contraceptive use from an experiment in Ethiopia (Desai and Tarozzi, 2011). Even if an effect is found, these short-run effects may simply reflect changes in spacing-patterns rather than changes in the overall number of children. When run for too short a period, experiments may also be prone to short-term health scares, such as the one experienced by an experiment in Zambia (Ashraf, Field and Lee, 2009).[13]

The Matlab family planning program experiment from Bangladesh is the least likely to suffer from these drawbacks. It began in 1978, and by 1984, fertility was 24 percent lower in the villages that received the intensive family planning program compared to the villages that received only the standard family planning program (Phillips, Simmons, Koenig and Chakraborty, 1988). More recent work using the same villages with data until 1996 finds a decline in fertility of about 15 percent in the program villages compared with the control villages (Sinha, 2005; Joshi and Schultz, 2007). These results reflect, however, a level of program intervention and intensity that some argue are unlikely to be sustainable (Pritchett, 1994).[14] Using a quasi-experimental approach, the Navrongo Project in northern Ghana also found a 15 percent reduction, although that was based on only the initial 3 years of the program (Debpuur, Phillips, Jackson, Nazzar, Ngom and Binka, 2002).

If longitudinal data were collected in parallel with the introduction of the program, program effects can be estimated using fixed effects, provided there are enough areas that receive a program between the (minimum) two survey rounds and provided the period between the rounds is long enough. Examples from Indonesia of this approach found a negative (but not statistically significant) effect on fertility, responsible for only 4 to 8 percent of the decline in fertility from 1982 to 1987 (Pitt et al., 1993; Gertler and

[13] The published version of this paper does not mention the scare (Ashraf et al., 2014).

[14] Per woman reached, the program cost 35 times more than the standard government family planning program and each averted birth cost USD 180 in 1987, 1.2 times GDP per capita at the time.

Molyneaux, 1994). Longitudinal data are, however, most often not available or cover too short periods, in practice limiting researchers to using cross-sectional data.[15]

If neither experiments or longitudinal data are available, one approach is to use variables that influence program placement but are unrelated to individual fertility, what is known as the instrumental variable (IV) approach. This is the least appealing approach when trying to identify the causal impact of family planning because it relies heavily on the choice of variables that affect program placement without any direct test for whether these variables are appropriate. Despite these drawbacks it is often the best we can do given the constraints.

Using this approach, a woman in Tanzania exposed to family planning throughout her fertile lifespan is found to have 4.13 children compared with 4.71 children in the absence of family planning programs (Angeles et al., 1998).[16] Lingering concerns remain, however, that some of the variables used to identify placement (such as child mortality levels and the presence of other family planning services) may also be correlated with unobservable variables that influence both placement and fertility decisions. Examining the difference in effects of providing subsidies for contraceptives or expanding access to previously not served areas, results from Indonesia show that contraceptive subsidies lower fertility by about 3 to 6 percent, whereas expanding the distribution network by one standard deviation lowers fertility by about 12 percent(Molyneaux and Gertler, 2000). These results are in with what is found for Profamilia, Columbia's family planning program, which reduced lifetime fertility by around half a child, equivalent to less than 10 percent of the sharp decline in fertility over the period the program was implemented (Miller, 2010).

While most work find an effect of about half a child, Pörtner, Beegle and Christiaensen

[15]There are also additional problems with using fixed effects, such as measurement error bias. For a discussion of this and other problems in the study of family planning see, for example, Angeles, Guilkey and Mroz (1998).

[16] See also Angeles, Guilkey and Mroz (2005b) on Indonesia and (Angeles, Guilkey and Mroz, 2005a) on Peru.

(2011) find a substantially higher effect of access to family planning in Ethiopia.[17] Access to family planning reduce completed fertility by more than 1 child among women without education, which is equivalent to a 20-25 percent reduction. No effect is found among women with some formal schooling, suggesting that family planning and formal education act as substitutes, at least in this low income, low growth setting.[18] It also highlights the importance of examining how access to family planning can vary depending on the recipients' characteristics.

A very different approach to understanding how family planning access affects fertility is to examine the response to disruptions in access or substantial changes in the price of contraception. These are—by their very nature—often temporary and therefore cannot tell us much about final fertility outcomes, but they do have the advantage here of mostly being exogenous to the individual women. That is, the disruption in supply of contraceptives comes as a surprise and is independent of the individual women's initial demand for contraception.

The 1997 financial crisis in Indonesia led to very large changes in prices of contraceptives, because it reduced the government's ability to subsidize the price of contraceptives (McKelvey, Thomas and Frankenberg, 2012). Despite the large price changes there was little change in the either the choice of method or the decision to use contraceptives. This result holds even for the poorest couples who are most likely to rely on the subsidy for access to contraceptives.

The United States's implementation of the Mexico City Policy[19], which forbid funding non-governmental organizations (NGOs) that perform or promote abortion services, has also been used to identify the effects of access to contraceptives because most of the NGOs

[17] The half a child reduction is also found in Romania using that country's ban on abortion and other birth control, with bigger effects the less educated the woman (Pop-Eleches, 2010).

[18] These results run counter to the argument in Feyisetan and Ainsworth (1996) that low education is a constraining factor in the uptake of contraception, although their data cover a period before long-acting injectable contraceptives became widely available.

[19] Also often referred to as the "Global Gag Rule". It was originally implemented in 1984 under the Reagan administration, rescinded during Clinton, then reinstated again under Bush, and rescinded under Obama.

affected also provide subsidized contraceptives. In Ghana contraception availability and use were reduced during the periods the policy was in effect (Jones, 2015). This led to significant increases in conception for rural women, but not for urban women. Within rural areas, the poorest women were the most affected with a 7 to 10 percent higher fertility, whereas less poor women saw increases of 3 to 6 percent. Perversely for a policy aimed at reducing abortions the effect was exactly the opposite. Rural Ghanaian women in the upper three wealth quintiles aborted 4 out of every 10 additional pregnancies that were the result of the lower contraception availability. The poorest women did not change abortion behavior and therefore ended up with significantly more children.

That the policy increases the use of abortions is supported by cross-country data for Sub-Saharan Africa (Bendavid, Avila and Miller, 2011). Using data from 1994 to 2008, countries were divided into "high exposure" and "low exposure" countries, depending on the level of financial assistance per capita provided by the United States when the policy was not active. The probability of having an abortion for a woman in a "high exposure" country was more than twice that of a woman in a "low exposure" country when the policy was in effect. Furthermore, there was no apparent difference in abortion rates when the policy was not in effect and the abortion rate in "high exposure" countries began to rise only after the policy was reinstated in 2001. Finally, the use of modern contraceptive stopped increasing after 2001 in "high exposure" countries, whereas "low exposure" countries continued to see increases in contraception use.

A different type of supply interruption is found in the Philippines, where a scheduled phase-out of international donations of contraceptives combined with decentralization of the responsibility of providing contraceptives and supply chain issues lead to substantial variation in the availability of contraceptives over time and across area (Salas, 2014). Both supply reduction and swings in contraceptive supply lead to significant increases the number of births. The poorest women, those living in rural, and those with less than a high school education are the most affected by supply fluctuations. The Philippines

were also the location of an outright ban on modern contraception in the city of Manila. Comparing Manila and other cities in the capital region, and assuming that these cities would have had similar fertility trends in the absence of the ban, the ban resulted in an approximately 3 percent increase in the number of children (Dumas and Lefranc, Forthcoming). The effect is relatively larger the younger the younger the mother.

No matter what the effect on fertility, it is possible that family planning programs can improve the wellbeing of both women and children simply through the better control over timing of births. There is, however, even less of a literature on the long-run effects on other outcomes than there is for the effect on fertility.

Schultz papers on Matlab and improvements in women's lives.

(Das Gupta, Bongaarts, Cleland and Joshi, 2011)

Sinha (2005)

(Joshi and Schultz, 2007)

(Li, Zhang and Zhu, 2005)

Rosenzweig and Zhang (2009)

An alternative explanation is that many people in developing countries have little incentive to reduce the number of children; the opportunity cost of women's time is low and children are potentially productive on the family farm or can serve as old age security (Banerjee, Meng, Porzio and Qian, 2014; Lambert and Rossi, 2016). As a result, rather than focusing on the supply of family planning, some economists emphasize policies that influence fertility demand such as household poverty and girls' schooling (Pritchett, 1994; Das Gupta et al., 2011).

Articles in Duflo2016

Ainsworth et al. (1996)

[Labor market policies]

7 Conclusion

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