

Copenhagen Consensus 2008 Challenge Paper

Women and Development

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First draft (November 2007). Please do not quote.

Note: This paper was written for the Copenhagen Consensus. The findings, interpretations, and conclusions are the authors' and do not necessarily represent the view of the World Bank, its Board of Directors, or any of its member countries. We would like to thank Monica Das Gupta, Michael Kremer, Clemens Rasmussen, Elisabeth Sadoulet, Paul Schultz, Dominique van de Walle, and Ludger Wößmann for helpful comments and discussions.

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1 INTRODUCTION

Over the past three decades gender issues have increasingly gained prominence on the development agenda. More attention is being given to the plight of poor and disadvantaged women in developing countries, and to the unfinished gender agenda in more developed countries. Recognizing the importance of ensuring equal opportunities for females and males on grounds of both fairness and efficiency and as an instrument for achieving poverty reduction and economic growth, the international development community has included gender equality among the Millennium Development Goals. MDG3 reflects the strong belief by the development community that starkly unequal access to assets and opportunities for men and women reproduce inequalities, with negative consequences for women's well-being, their families, and their communities.

Gender shapes one's role at home and in society and the economy. All cultures interpret and translate men's and women's biological differences into expectations about what behaviors and activities are appropriate for them and what rights, resources, and power they possess. In this Challenge Paper we identify and elaborate four key policies that address fundamental disadvantages that women face. These policy choices are informed by the concept of gender equality as equality in rights, equality of opportunity—equality in access to markets (e.g., labor, land, credit) and to resources or public services—and equality of voice. To illustrate, gender inequalities in access to education and health services and in access to productive assets, markets and employment affect power relations between women and men, starting with their relative ability to influence decisions within their households. These inequalities imply unequal capacity to take advantage of economic and other opportunities and to participate fully in public policy debates and formulation. We stop short of defining gender equality in terms of equality of outcomes because people in different societies can follow different paths in their pursuit of wealth and happiness, and because an intrinsic aspect of equality is to let women and men choose different (or similar) roles and different (or similar) outcomes according to their preferences and goals (World Bank 2001). Even in an environment of equal opportunity women and men may choose to pursue different goals and outcomes.

The next section describes the scope of the challenge in achieving gender equality, focusing on selected measurable disparities in rights, resources and voice. Section 3 presents a conceptual framework for understanding gender disparities; it underpins our choice of the key policies for reducing women's disadvantages. The body of empirical evidence that supports our selection is reviewed under the discussion of each policy in Sections 4. This evidence is used to inform our estimates of the benefits and costs of each policy. By comparing the benefit-cost ratios of the selected policies, Section 5 summarizes the menu of policies that we think are critical to improving women's status and reducing gender inequalities.

2 SCOPE OF THE CHALLENGES

This section presents indicators of gender equality, starting with the gender-specific rights embedded in customs and laws, and then focusing on gender disparities in human capital and access to credit and labor markets, and ending with women's political participation. We discuss only selected aspects of these challenges as illustrations; we do not attempt to be comprehensive in this review because recent reports, such as the United Nations' State of the World's Women 2006 and the Global Monitoring Report 2007 (World Bank 2007), already provide such a review.

Statutory and customary rights

National constitutions around the world affirm the principle of basic human rights, and many of them contain an explicit reference to nondiscrimination between women and men with respect to these rights. Many countries have introduced mandatory education laws recognizing basic schooling as a human right—but the way education is delivered deters girls more than boys from going to school in many settings. Many constitutions now give women and men the right to vote and to be elected to public office—but gender disparities in literacy and access to information and cultural norms restrict women's mobility outside the home and limit their participation in political forums. In practice, many women are often treated as minors in family law; for instance, they cannot pass on citizenship to a child or they need a male relative's permission to travel outside their locality; and laws that directly or indirectly constrain women's options for employment and their ownership of productive assets exist (World Bank, 2001, 2007).

Sweeping changes in a country's institutional environment, as reflected in constitutions, have the potential to reduce gender inequalities. Several countries have recently adopted legislation affirming the equality of men and women before the law and outlawing explicitly discrimination based on sex: For example, Timor-Leste's post-independence constitution affirms equal rights for women and men in marriage and the family and within social, economic and political life. Rwanda's 2003 constitution guarantees equal rights of spouses in marriage and divorce, outlaws discrimination based on sex, guarantees the right of women and men to vote and run for office, calls for equal pay for equal work, and establishes the right to education. In Azerbaijan, a presidential decree in 2000 instructed the government to ensure women and men are represented equally in the state administration and have equal opportunities under ongoing reforms (UNFPA 2004).

Other countries have passed more specific laws than these which address particular rights or discrimination problems. Belgium, the Dominican Republic, Portugal, Spain and Uruguay, among others, have passed laws increasing penalties for gender-based violence. Pakistan's national assembly passed the Protection of Women Bill in November 2006 removing rape from the jurisdiction of Islamic laws and making it a crime punishable under the country's penal code. In Papua New Guinea, the requirement for a "husband's consent" for contraceptive use has been removed and adolescents over age 16 can access reproductive health services without parental consent (UNFPA 2004).

The critical role of rights in gender equality is exemplified by the right to inherit land and property. For households dependent on agriculture, land is often the most important productive asset—and yet the distribution of land ownership is heavily skewed toward men, often because of inheritance laws and land titling laws that explicitly favor men. Under customary law in much of Sub-Saharan Africa, permanent land rights are held by men, typically male household heads. One way to address this problem might be co-ownership as has been debated in several countries in Africa. For example, in South Africa where custom stresses “universal access to land and to other factors of subsistence [and] priority of use so that families with more land than they can use should transfer it to the land-hungry” (Jacobs 1998, p. 81), the government has chosen an innovative way of dealing with the complexities of rural land tenure and gender inequalities. The government passed the Communal Property Association Act in 1996 which allows individuals to acquire land through membership in a communal property association.

Human capital investments

The push to achieve universal primary education with gender-informed education policies has yielded higher girls’ enrollments at all levels of schooling, and several countries have achieved gender parity in primary enrollments. This progress is quite remarkable and shows the responsiveness of households to policy interventions such as more community schools, lifting of user fees, and to stipends, conditional cash transfers, and vouchers targeted to girls. Between 1990 and 2005, girls’ enrollment in primary education increased in virtually all regions of the developing world; the sole exception was East Asia and the Pacific where girls’ gross enrollment rate already exceeded 100 percent in the early 1990s. Girls’ enrollment in secondary school rose as well, especially in the East Asia, Latin America and the Caribbean, and the Middle East and North Africa regions. By 2005, 83 developing countries (out of 140 with data) had met the intermediate MDG3 target of gender parity in primary and secondary enrollment rates (World Bank 2007).¹ Most of these countries are in regions where enrollment has historically been high — East Asia and the Pacific, Europe and Central Asia, and Latin America and the Caribbean. In the Middle East and North Africa, most countries met the target by 2005, but this region also included three countries (out of 13 with data) with significant female disadvantages in enrollment. In Sub-Saharan Africa, less than one-quarter of all countries met the target by 2005, but reliable data are scarcer in these countries. In South Asia, Bangladesh and Sri Lanka are notable for achieving parity, but the others have failed to meet the target of parity in secondary school enrollment. In all, 35 countries—most in Sub-Saharan Africa—did not achieve the target by 2005 but are on track to attain the target by 2015.

At the tertiary education level, female enrollment does better relative to boys. In 2005 the female tertiary enrollment rate lagged behind the male rate in 63 countries (of 130 countries

¹ This is measured using the gross enrollment rate. Following UNESCO (2004) parity is defined as a female-to-male ratio exceeding 0.97. A ratio below 0.97 indicates significant female disadvantage. In 35 countries (of the 83 that achieved the 2005 target) there was significant *male* disadvantage, with boys’ gross enrollment rate lagging behind girls’ (the female-to-male ratio exceeded 1.03). In these countries, mostly countries of East Asia and the Pacific, Europe and Central Asia and Latin America and the Caribbean, boys’ enrollment exceeds 90 percent. Thus a male disadvantage tends to occur in education systems with overall high participation in schooling.

with data) but exceeded the male rate in 65 countries.² This overall reversal in enrollment rates is largely due to boys leaving school for jobs after the secondary level, whereas girls of the same age do not have the same work opportunities. In some countries, the principal draw for teenage girls would be early marriage and parenthood.

Despite greater equality in enrollment rates, it is estimated that of the nearly 137 million illiterate youths in the world, three-fifths are girls (UNESCO, 2005). Not surprisingly, the female-to-male literacy ratio is lowest in Sub-Saharan Africa, Middle East and North Africa, and South Asia, as these are the regions that also have more unequal primary and secondary enrollment rates. In 25 of the countries in these regions, the ratio is fewer than 80 literate young women for every 100 literate young men. The ratio is lowest in Yemen and Afghanistan, where only 36 young women are literate for every 100 literate young men.

A second challenge is that average national gender parity ratios tend to mask significant gender disparities among urban and rural populations. The graphs below of data from the Demographic and Health Surveys illustrate vastly different enrollment profiles between urban and rural people. Disaggregations by income, race, ethnicity, and caste can also reveal substantial gender gaps even in countries that do well at the national level. These gender gaps between urban and rural areas, among ethnic or racial groups, or between rich and poor people explain why some countries have not reached the gender parity target (e.g. Bolivia, Cambodia, Ecuador, Guatemala, Lao PDR, Morocco, and Pakistan) (Lewis and Lockheed 2007). For education and literacy, the female disadvantage is always larger in rural areas and among lower-income households. This is further accentuated in countries that have not reached overall gender parity in school enrollments (largely in Sub-Saharan Africa and Middle East and North Africa).

[Figure 1 about here]

Access to markets

Studies from a diverse set of countries, including Bangladesh, Brazil, Canada, Côte d'Ivoire, Ethiopia, France, Indonesia, South Africa, Taiwan (China), and the United Kingdom, indicate that women's and men's relative control of resources has significant—and different—impacts on household consumption and expenditure. While the precise effects of female and male resource control differ from place to place, results suggest that increases in the relative resources controlled by women are associated with a relatively larger share of household resources going to family welfare, especially to expenditures on children—even after controlling for per capita income and demographic characteristics of the household. Greater resource control by women also leads to expenditure patterns and outcomes that strengthen women's well-being and status in the household.

Age patterns of labor force participation, however, show that in all regions of the world, men have higher participation rates than women. The largest gender gap in participation occurs

² Female disadvantage was evident mainly in Sub-Saharan Africa and South Asia. Male disadvantage was notable in Middle East and North Africa (Algeria, Iran, Jordan, and Libya), East Asia and the Pacific (the Philippines and Thailand), Latin America and the Caribbean (Honduras, Nicaragua, Panama), and Europe and Central Asia. Reflecting the legacy of the Soviet Union and historically high enrollment rates in Europe and Central Asia, countries there had high female tertiary enrollment rates that exceeded male enrollment rates.

between the ages of 25 to 49 which is not surprising since the gender division of tasks typically results in women in this age group contributing more of their time to child and home care while men increase their participation in work outside the home. Three distinct patterns emerge across regions.

First, in some countries, participation is quite low and shows the greatest gender difference (Middle East and North Africa, South Asia, and Latin America and the Caribbean). For the 20-24 age group, the average female labor force participation rate ranges from 37 percent to 49 percent, below the average of 55 percent or higher for the remaining regions. For the 25-49 age group, the average female participation rate is between 37 and 60 percent, again much lower than that in the remaining regions. In these regions, for both age groups, male labor force participation rates are between 1.5 to 2 times the female labor force participation rates.

Second, in other countries, mainly in Sub-Saharan Africa, women's participation rates for both age groups are high, the gender gap is low, and women are concentrated in low-paying, small-scale agriculture or self employment in the nonagricultural sector (Table 1). During the period 1990-2003 women's share in nonagricultural wage employment increased in all regions—but the increase was modest and uneven across regions and countries (World Bank 2007). Particularly in formal sector employment, large gender gaps persist in many regions, particularly in Sub-Saharan Africa and South Asia (e.g. Klasen, 2006; Klasen and Lamanna, 2007).

[Table 1 about here]

Third, in yet other countries female participation rates are high, gender gaps in participation rates are low, and women's share in non-agricultural paid work is high. In these countries (predominantly in East and South-East Asia), the gender wage gap is large, and most of the gap appears to be unrelated to worker characteristics (Klasen, 2006).

There are many reasons why women's labor force participation and earnings are lower than men's. These reasons include the division of responsibilities at home which results in women's marginal product of time spent in child care and home production being higher than the marginal product of their time in the labor market, which might feed back into lower investments in their schooling. The calculus of these decisions within the home has been the topic of numerous theoretical and empirical studies in the social sciences (led by the seminal work by Becker 1965). The reasons also include implicit or explicit gender discrimination in wage employment, and the aforementioned statutory or customary laws preventing equal access to land or property. In many developing countries where wage or formal employment is a relatively small part of the labor market, women's lack of access to land and capital for self employment is an important barrier (see Estudillo, Quisumbing and Otsuka, 2001).

Across developing regions female-run enterprises tend to have less capital than those run by males. Throughout Sub-Saharan Africa female farmers have poorer access than male farmers to machinery, fertilizer, and extension information (Saito et al., 1994). And with a few noteworthy exceptions, female-managed enterprises—farm and nonfarm—continue to have poorer access to credit and related financial services. Giving women more access to credit markets opens up income opportunities for them. In addition, a number of studies have found that giving women access to credit improves their bargaining position within the household, with

second-round benefits that include better health status of children. Improving women's access to productive capital is one of the four policy options we focus on in this paper, so we return to this topic in section 4.

Safe motherhood

A country's population growth rate and the associated age structure of its population affect its ability to address issues such as hunger, housing shortages, large dependency burdens and environmental degradation—all intensified by rapid population growth. They also affect the welfare of individuals and families in the current as well as succeeding generations (see, for example, Bloom and Williamson, 1998). Fertility rates have declined in developing countries from over 6 children per woman in the 1950s to 2.8 children per woman, but fertility rates remain at 5.46 children per woman in the 49 least developed countries, mostly in Sub-Saharan Africa (Levine et al., 2006). Around eight million women suffer life-threatening pregnancy-related complications each year; over 529,000 women die, of whom 99% are from developing countries (UNFPA, 2004). South Asia and Sub-Saharan Africa account for 74% of the global burden of maternal conditions (Disease Control Priorities Project 2006). In the developing world, one-third of all pregnant women receive no health care during pregnancy, and 60% of deliveries take place outside of health facilities, with skilled personnel assisting only half of all deliveries (UNFPA 2004).

Teenage pregnancy rates are still high in many countries in the developing world, especially in African countries (Table 2). Childbearing among teenagers can bring disproportionate health risks to the mother and the baby (maternal mortality, delivery complications, premature delivery, and low birth weights). Beyond health outcomes for mother and baby, adolescent motherhood is associated with early departure from school, lower human capital accumulation, lower earnings, and a higher probability of living in poverty.

[Table 2 about here]

In developing countries, 61% of maternal deaths occur 23-48 hours after delivery because of problems such as postpartum hemorrhage and hypertensive disorders or after 48 hours because of sepsis. Complications from unsafe abortions account for 13% of maternal deaths, though this is probably an underestimate (Table 3). Direct obstetric conditions (those that specifically arise from the pregnancy) account for 80% of all maternal deaths, while indirect obstetric conditions (those aggravated by or threaten pregnancy) account for the remainder. Hemorrhage is the most common cause of direct causes of death. Indirect causes included diseases such as HIV/AIDS and malaria (Graham et al., 2006).

[Table 3 about here]

Women's risk of pregnancy-related death or disability depends on the number of and spacing between pregnancies, mother's age, and whether the birth was an unwanted one. Family planning information, education, and communication programs have increased contraceptive use and reduced fertility in many developing countries. Since 1994, family planning use has increased globally from 55 per cent of married couples to around 61 per cent; it has grown by at least 1 percentage point per year in 68 per cent of countries with available data and by at least 2 points per year in 15 per cent of these countries. Use varies regionally, however, ranging from

about 25 per cent in Africa to nearly 65 per cent in Asia (where high use in China raises the average)³, and 70 percent in Latin America and the Caribbean and in the developed regions (UNFPA, 2004). The official indicator for MDG6, contraceptive prevalence rate, considers all methods of contraception, computed as the percentage of women who are practicing, or whose sexual partners are practicing, any form of contraception, traditional or modern (United Nations, 2003). Compared to traditional methods, however, modern methods offer women and their partners a more reliable way to control their fertility and to prevent the spread of sexually transmitted diseases.

Political participation and voice

The MDG indicator of gender equality in the political sphere is the share of women in national parliaments. The percentage varies from 9.6 percent in the Arab countries to 17.8 percent in Sub-Saharan African countries, as compared with 41.6 percent in Nordic countries (Table 4). In truth, this is a very limited measure of women's political participation, but it is one measure for which data are currently available across countries.

[Table 4 about here]

There are many other potential indicators of women's voice as citizens. Among the summary measures are the Gender Empowerment Measure introduced by the United Nations Development Program which combines political participation, economic participation, and economic power (e.g. Klasen, 2006b). But there are a number of other useful and interesting indicators. For example, one such indicator is the number and share of women and men with basic citizenship documents, starting with birth registrations (and ending with death registries). Recent research by the Inter-American Development Bank showed underregistration of births in six Latin American countries, varying from 8.4 percent in Peru to 25.8 percent in the Dominican Republic. Characteristics associated with the risk of a child being undocumented from birth to age 5 include poverty, rural residence and teen motherhood (Duryea and others 2006).

What are the consequences of women not being represented well in politics? In many rural settings, for example, collecting water and firewood is largely the responsibility of women and girls,⁴ and changes in the availability of these resources have consequences for them. Studies show that due to women's lack of voice and of influence over the rules for forest protection by being excluded from discussions to frame those rules, women have been denied the usufruct rights that they formerly had (Cornwall, 2003). These rules were formulated by men without involving the women in proposing viable alternatives following forest closure. Although there is a growing practice of some women representation on forest committees, their influence depends on the good will of its head, who is usually a man.

³ When China (with a large population and high prevalence) is left out of the calculations, only 46 per cent of married women in Asia are using contraception.

⁴ In Ghana, Tanzania, and Zambia women account for no less than two-thirds of household time devoted to water and fuel collection, while children—mostly girls—account for between 5 and 28 percent of household time spent on these activities (Malmberg Calvo 1994). In rural Nepal and Pakistan poor access to firewood means women spend more hours collecting firewood and fewer hours generating income (Cooke 1998; Ilahi and Jafarey 1999).

Women who succeed in winning elections may be extremely effective leaders and perceived as such, but the performance of this select group of women does not inform us about the performance of the average female politician relative to the average male politician. Women's opportunities to influence decisionmaking rest not simply on women being elected into office, but also on how and whether women represent women's interests, whether they raise their voices and, when they do, whether anyone listens. Voice does not automatically translate into influence. Agarwal (1997) draws attention to familiar constraints: time; official male bias; social constraints about women's capabilities and roles; the absence of a "critical mass" of women; and lack of public speaking experience.

3 A FRAMEWORK FOR CHOOSING POLICY OPTIONS TO ACHIEVE GENDER EQUALITY

Elements of a framework

This section presents a simple analytical framework for the paper (Figure 2). The components of this framework correspond to the challenges discussed above:

Leveling the field with respect to legal and regulatory systems, especially with respect to citizenship rights, ownership of assets and inheritance, labor force participation. Gender equality in rights is an important development goal in its own right. Legal, social, and economic rights provide an enabling environment in which women and men can participate productively in society, attain a basic quality of life, and take advantage of the new opportunities that development affords. Disparities in rights constrain the choices available to women in many aspects of life—the right to marry, to divorce, to determine family size, to inherit and manage property, to allocate one's labor to household enterprises, to undertake income-earning activities outside the home, to travel independently. Many aspects of the law in developing countries continue to confer unequal rights and status on people based on gender, with important consequences for women's autonomy, security, opportunities, and well-being. Legal reform is a necessary step in improving gender equality in rights—and in establishing a supportive institutional environment more broadly. In many cases, the cost entailed by these reforms is often largely of a political or social nature, rather than a fiscal or financial one. In many cases too, appropriate laws already exist; what are lacking is implementation and enforcement which do have cost implications, both political as well as financial. The state clearly has a role to play in giving a strong mandate through reform of laws and regulations. But the effectiveness of statutory reform depends largely on the state's capacity to implement and enforce—and on the leadership and action of other groups in society.

Leveling the field with respect to access to markets (e.g., credit, labor), and public investments and services (e.g. education and health services). Markets, too, can reduce gender discrimination. When markets function openly they facilitate information exchange and embody a powerful set of incentives for making choices on the basis of productive efficiency rather than gender, race, or ethnicity. As discussed above, as a whole women and girls have systematically poorer access than men and boys to a range of resources and markets—e.g., human capital,

physical and financial capital, and employment opportunities. Such disparities limit women's ability to participate in development and to contribute to higher living standards for their families. They mean unequal exposure to risk and vulnerability in the face of personal or family crises, in old age, and during economic shocks.

- Disparities in education, employment, and wages not only hurt the females affected but also reduce the overall allocative efficiency of the economy, with static and dynamic effects for income levels and economic growth. Gender disparities that begin at a young age have significant long-term effects and are more costly to overcome later. Restricting the pool of people to be educated to boys reduces the overall talent pool from which to draw for education. Declining marginal returns to education also ensure that the social marginal returns to educating boys are often smaller than educating girls; restricting the employment pool to males similarly reduces the pool of best matches for employment.
- Whether engaged in self-employment or wage employment, higher women's productivity and earnings are associated with higher household income and expenditure. Employed women can contribute to current poverty reduction and economic growth through higher consumption and to future poverty reduction and growth through their impacts on children's accumulation of human capital and potential impacts on aggregate saving.
- Other indirect effects of greater female education, employment, and earnings include a variety of externalities generated this way, including smaller and healthier families, and a greater focus on investment in children.

Leveling the field with respect to voice is about equalizing bargaining power between men and women. The right to engage in public debate, the right to vote, and the right to run for public office are rights that many people now take for granted. Nearly all countries now give both women and men the right to elect political leaders. But this has not always been the case. Most countries gave women the right to be elected to public office even later than they gave them the right to vote, and this right often was given under various restrictions. For example, Greece allowed women to vote in 1930—but to stand for office in municipal and communal elections only in 1949 and at the national level in 1952 (WISTAT 1998). In some cases, this will entail legislative reform such as granting to women full citizenship rights of voting and running for political office.

[Figure 2 about here]

Achieving these equalities is manifested in the different spheres of life – the household, community, economy and society. Equality in rights, resources and voice leads to greater equality in outcomes when people choose to take advantage of the opportunities that open up. Sometimes, making a choice that promotes gender equality does not seem possible because information is incomplete or imperfect. All of these are expected to increase economic productivity, reduce poverty and deprivation, and lead to longer and better lives.

Selecting a program of policy options

In the next section, we present four policy options for improving the status and welfare of women relative to men in developing countries—increasing and improving girls' schooling, improving women's access to financial services, providing support for women's reproductive

roles, and increasing women's political representation. These choices correspond approximately to the challenges discussed in the previous section and also to the elements of the simple framework presented here. While many other policy options are available, we have chosen to focus on these four because they provide the foundation on which other policies can build. In particular, they increase *women's agency*, that is, women's ability or power to make choices about their lives and to exercise those choices. Consistent with the analytical framework, they address the need for leveling the field of opportunities for men and women as defined by the rights given to them in a country's legal and regulatory framework, and the basic barriers to participation in the domains defined by the household, markets and civil society. Also, these are options where there have been some, if limited, credible evaluations of interventions that can form the basis of our empirical assessment. The first three options are perhaps expected given the gender literature; the fourth option is less so and needs further attention in the literature.

In choosing the options, we recognize that there are significant cross-country or regional differences to consider with respect to both costs and benefits for each option. Hence, one policy option that would be more greatly needed in one country or region may not be as beneficial in another setting. Moreover, within countries, different levels of gender inequalities persist among both the rich and the poor, but they are often greatest among the poor, so options that address issues related to poorer segments of populations carry more weight in our estimation. In projecting the benefits and costs of the global solutions, we ignore most of the across- and within-country differences. The enormous task of taking all these differences into account under conditions of limited data that are comparable across countries and limited available research compel us to rely on general, sometimes heroic, assumptions.

In principle, options could be gender-neutral policies (such as lifting the user fees for all schoolchildren expecting that more out-of-school girls would benefit) or gender-targeted policies (such as lifting user fees only for girls). Gender-neutral initiatives may be more costly (e.g., elimination of secondary school fees as applied to all students would have a larger marginal impact on girls if the price elasticity of demand is higher for girls but the cost of a universal initiative would also be far more costly than a targeted scholarship program, even net of implementation and monitoring costs of a targeted program) and more difficult to reverse for political reasons. On the other hand, they might also be easier to implement politically because their universal coverage would not attract resistance from non-beneficiaries. With these considerations, we have chosen to propose gender-targeted interventions in areas where such targeting has already proved to be politically feasible, at least in some contexts.

In measuring the costs of each option, we include rough estimates of the direct and indirect costs of implementation, enforcement, targeting and monitoring as comprehensively as possible. Some costs are incurred by individuals, some by households, and some by the government or the program unit. Costs are incurred over a period of time for each of the option, but the duration of the period varies according to the alternative scenarios we consider. We use cost data provided by previous studies, patching together information from different sources, and so we are constrained by the availability of appropriate data.

Each option implies both short-run and long-run benefits. As requested in the framework for Copenhagen Consensus Challenge papers, we make projections about benefits over a period

of 100 years. For such a long period, it makes sense to trace not only obvious direct benefits but also more indirect, “second-round” or “second-generation” benefits. As with costs, benefits will accrue to individuals, to households, to communities and society as a whole. For example, more schooling for girls today will confer long-run benefits to those girls in terms of their health and employment, as well as to their children’s well-being in the future. At the same time, perhaps for this and other reasons, studies have found a positive association between female education and measures of aggregate economic growth

The benefits for each option are expressed alternatively in terms of increased income or disability-adjusted life years (DALYs). DALYs are estimated from the potential years of life lost due to premature death, poor health, or disability for all age groups. It was used as a measure of adult morbidity and mortality by the Global Burden of Disease project, a worldwide collaboration of over 100 researchers, sponsored by World Health Organization and the World Bank. The study used information from a number of countries to estimate the costs of individual causes of morbidity and mortality to healthy life. In this paper, each DALY gained is valued as equivalent to either \$1,000 or \$5,000, and both sets of estimates are presented for each option. Finally, to compare the predicted costs and benefits associated with each option, we compute present values using two discount rates of 3 and 6 percent.

4 OPTIONS FOR POLICY

This section presents four policy options for improving the status and welfare of women in developing countries. The discussion of each option begins with the justification for choosing the option, and then presents the benefit and cost estimates associated with the option, and finally alternative benefit-cost ratios corresponding to a range of scenarios. We begin with the option that pertains to schooling which are investments in the earlier years of life of a woman and then proceed to options that relate to three aspects of a woman’s life—as producer, mother, and citizen and leader.

Option 1 – Increase and improve girls’ schooling

As discussed in section 2, while there has been considerable progress in reducing the gender gap in schooling enrollments and achievements across the developing world, significant gender gaps remain in particular regions and at particular levels of education. Specifically, in parts of South Asia (most notably Northern India and Pakistan) and many poorer countries in Sub-Saharan Africa (especially in West Africa), there remain large gender gaps in primary enrollments. In a larger group of countries across the developing world, there are sizable gender gaps in secondary enrollments. They are particularly large in the same regions of South Asia and Sub-Saharan Africa (see World Bank 2007). As a result, women in South Asia still have more than two fewer years of schooling than men; the differential is about 1.5 years in Sub-Saharan Africa on average (and much larger in individual countries, see Barro and Lee, 2001).

This inequality in schooling is not only an issue of gender inequity that demands rectification, but also an issue of efficiency in terms of lowering the development opportunities

of the countries involved. The particular benefits to reducing the gender gaps in education are reviewed and discussed in detail in Klasen (2002) and Abu-Ghaida and Klasen (2004), so we summarize them here:

- increasing the overall human capital of the population by removing the sex-specific distortion (under the assumption of an equal distribution of talents, a discriminatory policy will mean that the education system is not educating the most talented);
- increasing the average returns to education under the assumption that the marginal returns to female education are higher (e.g. Orazem and King, 2007; Knowles et al., 2002);
- promoting female employment which would reduce a similar distortion in employment opportunities, increase female bargaining power, and improve economic and political governance (see World Bank, 2001 for a discussion);
- reducing fertility and population growth by inducing a quantity-quality trade-off that promotes economic growth (e.g. Galor and Weil, 1996, Lagerlöf, 2003);
- reducing undernutrition and mortality rates in families as educated women have healthier children through more health knowledge, more income, and more bargaining power (e.g. Smith and Haddad, 2002; Klasen, 2002; Summers, 1994); and
- promoting the education of the next generation (as female education has a large impact on the inter-generational transmission education, e.g. Behrman et al., 1999; Holmes, 2003; for an opposite view, see Behrman and Rosenzweig, 2002). Moreover, mother's education can exert a larger impact on daughters' education than father's education.

The growth, fertility, and mortality impacts of female education have been examined extensively in the empirical literature (for a review, see e.g. Klasen, 2006, World Bank, 2001, and Abu-Ghaida and Klasen, 2004). In particular, the positive impact of female education on growth has been well-documented with estimates in a relatively tight range (surveyed in Abu-Ghaida and Klasen, 2004; individual studies include Dollar and Gatti, 1999; Klasen, 2002; Yamarik and Ghosh, 2003; Knowles et al., 2002); similarly there is an even larger literature documenting the impact of female education on lower fertility, better nutrition, lower mortality, and better education of children (e.g. Schultz, 1997, Orazem and King, 2007).

An important analytical issue is why these gaps persist despite their apparent inefficiency. Here it is clear that a range of externalities play a central role. In the regions affected, parents do not typically reap the full benefits of educating girls as they leave the household upon marriage and will, in contrast to sons, not be responsible for the old age support of the parents (see models in Hill and King, 1995; Orazem and King, 2007; Rosenzweig and Schultz, 1982); nor will they typically be able to preserve the family's name. The benefits to the next generation that accrue via the mortality, education, and fertility effects are also not usually captured by the parents making the schooling decision for the girls. As in other instances of external effects, there is therefore a clear case for a public intervention to internalize these externalities.

In the longer term, policies that aim to reduce these incentives to favor sons in these circumstances could include the build-up of formal old-age security systems or to change

societal attitudes about the role of sons and daughters for old-age support of parents. These are long-term societal changes that would be required, but are sometimes hastened by rapid social and economic change (e.g. Dollar and Gatti, 1999). In the short to medium-term, a much more promising approach to address these externalities is to internalize them in the sense that public policy provides special incentives to send girls to school to balance the existing incentives favoring boys. The critical question is what type of policy would be able to increase girls' schooling effectively, particularly in the two regions where gender gaps remain pervasive, namely, South Asia and Sub-Saharan Africa. In principle one could think of policies that improve the opportunities of schooling (i.e. increasing the supply of schooling for girls) or of policies that would increase the demand by parents and girls for higher levels of female education.

Given the relatively higher enrollment rates in developing countries today, increasing the supply of female education opportunities is unlikely to be the most promising approach to making a significant difference in reducing the education gender gap for the following reasons:

- Due to the presence of co-education in most developing countries (including virtually all countries of Sub-Saharan Africa), the gender gap in schooling in these contexts is not primarily due to the unavailability of schools for girls. There are exceptions to this, with Pakistan probably being the most prominent one where single-sex schooling is the norm and the supply of schools for girls (particularly at the secondary level in rural areas) is much more limited than for boys. (Some other poor Islamic countries such as Yemen and rural areas in Morocco might also be relevant) As concluded by Alderman et al. (1996), about half of the difference in schooling outcomes of boys and girls might be due to the simple unavailability of school for girls. In such circumstances, building schools could be the most cost-effective policy to increase girls' schooling. In addition, there is some evidence that parental reluctance to send a child to school in these circumstances also relates to the lack of a culturally appropriate learning environment for girls, which includes ensuring girls' safety on the way to school, provision for latrines, and female teachers (e.g. World Bank, 2001). Meeting the supply of schools would have to address these issues.
- In general, the enrollment response to a school building program, while statistically significant, has been found to be rather small in the literature. This is discussed in detail by Pritchett (2004) and Filmer (2004). The main reason is that reducing the distance to primary schools (and, equivalently, in travel time) is not the main constraint for female schooling as other direct and opportunity costs weigh much more heavily (see below). However, there is evidence that the impact is larger at the secondary level.⁵
- Of course, there are likely to be exceptions to this argument. Duflo (2001) finds that the school building program in Indonesia about 30 years ago had a significant effect on enrollments, achievements, and earnings (unfortunately, only males are examined), but

⁵ The impact of the supply-side interventions of Mexico's PROGRESA program suggests that a cohort of 1,000 girls who have completed the primary cycle will receive 27 more years of schooling in lower secondary school as a result of a decrease in the average distance to such schools; the corresponding number for boys is 25 more years of schooling (Coady and Parker 2004).

there are reasons to believe that these effects would not apply everywhere (see Orazem and King, 2007). A second exception is that the supply of a close and culturally appropriate school for girls can have sizable impacts on enrollments in some contexts provided that the school is quite close (not necessitating girls to travel more than half a kilometer on their own), a female teacher is present, and there are adequate sanitary facilities for girls (e.g. Hill and King, 1995; Alderman, Orazem and Paterno, 2001; Orazem and King, 2007; Herz and Sperling, 2004). In these contexts, specific supply-side interventions could help.

Another approach to the improvement of female education would be to improve the quality of schooling. While there clearly are large quality problems, it is somewhat doubtful that they could be addressed primarily by spending more money on schools (see discussion by Pritchett, 2004). Rather, more needed are longer-term reforms of the school systems that increase the accountability of schools and teachers, improve transparency regarding schooling results, and provide incentives to improve instruction, among a range of other measures (see Glewwe 2002, Pritchett 2004). As these reforms benefit both boys and girls, we do not focus on them here but should note that such reforms would be an important (and probably not financially costly, although surely politically difficult) complement to the measures that we are proposing here.

Demand-side interventions seek to increase female schooling by increasing parental demand to send their daughters to school. Given that schooling involves significant direct costs (school fees, uniforms, textbooks, supplies) that are sizable (as a share of per capita income) in many developing countries (the ILO MISA study by ILO/UNCTAD Advisory Group (2001) estimates these to be 22 percent of per-capita income in poor African countries) and sizable opportunity costs (as children in school are not available for child labor, household production, or sibling care), lowering these direct and/or opportunity costs would likely increase enrollments. In many sub-Saharan African countries, the easiest way to accomplish this is to lift user fees as has been done recently in Uganda, Lesotho, Malawi, and Tanzania. In each case, the supply response has been very large although it is not clear yet whether the larger enrollments will translate into higher completed schooling and better skills as they might have been achieved at the expense of the quality of learning (see Deininger, 2003). If school crowding were an issue, one would have to budget additional funds to pay for more teachers and more classrooms, although not necessarily in proportion to the increase in enrollments as class sizes can increase somewhat without a large impact on quality (e.g., double shifts can be used to save on construction costs).

If the aim is to increase female schooling in particular, one option would be to lift user fees for girls only although this might be politically difficult to implement (but surely not impossible). A variant of such a policy would be to distribute vouchers to girls that would cover the user fees and would in addition add an element of school choice with possibly additional positive repercussions on schooling quality (see Angrist et al., 2002 on Colombia; Orazem and King, 2007).

Another option would be to hand out cash to families where girls are out of school in the form of an unconditional cash transfer, with the expectation that the income elasticity of girls'

schooling exceeds that of boys' (e.g., Tansel, 2002, for Turkey). A careful analysis by Todd and Wolpin (2006), however, finds that the response would be about 20 percent lower than if the cash transfer were conditioned on school attendance. This then suggests conditional cash transfer (CCT) programs in which households receive funds that are tied to children attending school. Principally, there have been two types of CCT programs. One type refers to programs in which households receive stipends for direct and indirect schooling costs of girls, usually with a condition that the girl attends school on a regular basis. A prime example is the Bangladesh secondary education stipend program for girls. This program and similar ones in Pakistan and Cambodia have been found to increase enrollment rates significantly (see Kim, Alderman and Orazem, 1999, on Pakistan; Khandker, Pitt and Fuwa, 2003 on Bangladesh, and Schady and Filmer, 2006 on Cambodia). A second type is a transfer of resources to households (typically to mothers), with the condition that children within a certain age range attend school. The Latin American CCT programs, pioneered by Mexico's PROGRESA (now called Oportunidades) program, are the classic examples of such programs. They are particularly useful as points of reference as they have been rigorously evaluated using randomized experimental methods. Following these programs, we propose a CCT program that transfers resources to mothers conditional on girls of schooling age actually attending school as the most feasible and cost-effective way to increase female education for the following reasons:

- The benefits in terms of increases in schooling compared to an unconditional cash transfer are clear and have been demonstrated by Todd and Wolpin (2006):
- They are arguably also preferable to a policy of lifting user fees particularly in cases where the parents, on their own, may not ensure their child goes to school regularly compared to a case where a cash transfer is involved. Also in many cases, the CCT would be larger than the current user fee and the removal of a user fee alone may not be sufficient inducement to get and keep girls in school. Finally, the grant might have the benefits of a voucher system in which parents are able to exercise different schooling options (including private ones where user fees might be hard to lift). This feature might also be particularly relevant to ensure that increased enrolment does not lead to crowding and falling average quality of schooling (see also below).
- They bring additional cash into the hands of women. To the extent that this cash will not be needed to fund the extra direct and indirect schooling costs, it is likely to positively impact health and nutrition of all children (e.g. Thomas, 1990, 1997; Haddad and Hoddinott, 1994). This is particularly the case for those households where the girls are already at school and where the CCT program is a pure windfall (see below).
- They can help reduce the impact of shocks on household welfare without compromising long-term investments in human capital in the process. As shown by de Janvry, et al. (2006), the PROGRESA program was particularly able to prevent drop-out from school in times of economic crises.⁶

⁶ From an average secondary enrollment rate of 65 percent for boys, the rate increased by 8 percentage points in 1998 and by 5 percentage points a year later. Girls' baseline enrollment was lower at 53 percent, and the program raised this by 11-12 percentage points in both years, about double the impact on boys (Coady and Parker, 2004).

- They are (or could be made) virtually identical in design and thus expected effects to stipend programs for girls. These stipend programs are also CCTs with the condition being that the girl be in school.

More specifically our empirical assessment will be based on a CCT program paid to mothers and linked to girls' education in a typical Sub-Saharan African or South Asian country (average per capita income of \$450 in exchange rates).⁷ In this option, this sum is paid out to mothers over 7 years to a cohort of girls, following them from the 3rd to the 9th grade of basic education. Taking the entire eligible population of the three regions and using population data and projections from the UN would amount to about 70 million (118million) potential beneficiaries in Sub Saharan Africa (South Asia) in 2005, rising (falling) to about 115 million (112 million) by 2050.

Benefits

The benefits of female schooling have already been discussed above. Here we want to discuss the benefits of the CCT program as the specific policy to increase female education. We base our discussion on the rigorous evaluations of Mexico's PROGRESA program (Schultz, 2004; Behrman, Parker and Todd, 2008; Todd and Wolpin, 2006).

Schultz (2004) finds that in the program schooling enrollments of girls increased in such a way that their expected years of schooling was 0.7 years higher than in areas where the program was not operative. Behrman, Parker, and Todd (2008) examine the medium-term impacts of the program and find that it will increase female education by about 1 year in the medium-term. Todd and Wolpin (2006) find that one could generate larger effects if the CCT was focused on the transition from primary to secondary schooling, or just focused on secondary education.

We will use the benefits of 0.7-1 years more schooling for our assessments of this option. We believe that this will underestimate the benefits for two reasons. First, PROGRESA was applied in a situation where school enrollments were already relatively high, and certainly much higher than in our target countries. Given that the Mexican program thus had to entice a smaller and presumably harder-to-reach group to enroll and stay in school, the benefits would be smaller than in settings where a large share of the female population would probably need relatively little enticement to go to school.

Second, these CCT programs have clear benefits beyond improving educational outcomes as they simply relax the budget constraint and have been found to also improve health and nutrition outcomes in households, reduce child labor, and other positive effects (Skoufias, 2005; Behrman, Parker, and Todd, 2008). Bearing in mind that many households who would get these benefits already send their child to school in any case, for them these funds will be pure

⁷ The precise scale of the program does not really matter and given the imprecision of the calculations we present here it is hard to determine an 'optimal' scale. Given the magnitude of the problem at hand, one could easily imagine a program that would cost \$10billion. But one should keep in mind that a program that would try to get all girls into school would be much more costly (on a per girl term) as the costs to get hard-to-reach girls into school (who are out of school due to extreme remoteness or extreme cultural and economic barriers to schooling) would be much higher. See Glewwe (2005) on costs of universal primary education (UPE).

windfall that can be used to pay for other pressing needs of the household. These benefits will be ignored in the subsequent empirical assessment, thus significantly underestimating the total benefit of such a CCT program for female education. In a sensitivity analysis we will consider these additional benefits, however. This is all the more the case, as these funds would accrue to the mothers and would strengthen their influence in household decision-making. Studies by Thomas (1990, 1997) and others (e.g., Haddad and Hoddinott, 1994) have found that the influence of such increased funds on nutrition and health of children is sizable (see World Bank 2001 for a summary).

Regarding the benefits of female education, we will use the results from Knowles et al. (2002) who found an elasticity of per capita income to years of female schooling of 0.37, i.e. a 1% increase of female schooling would increase per capita income by 0.37%. This estimate is actually on the low side of a range of studies that have examined this issue (e.g. Klasen 2002; Klasen and Lamanna 2007; Forbes 2000; Abu-Ghaida and Klasen 2004). This estimate is also lower than one we would obtain from using a typical rate of return calculation as done by Schultz (2004) who, for example, uses a 12% rate of return. We use estimates of the macro returns to education as there has been some question about the micro returns overestimating the social returns to education (see Pritchett 2001). We apply the macro elasticity to average per-capita income (\$450) over the working life of a woman. In addition, we add half of that benefit for the remainder of the 100 years due to the intergenerational transmission of education, which is within the range of typical findings in the literature (see, for example, Gaviria, 2007 and Bourguignon et al. 2007 for evidence).

We consider only one of the many external benefits of female education discussed above; specifically, we focus on the mortality benefit in which we assume that one more year of female education reduces under-five mortality by 13/1000. This is based on Schultz (1997) and is again lower than other estimates (see Abu-Ghaida and Klasen 2004 for a discussion). We will not separately estimate nutrition benefits or the benefits that would accrue through fertility decline associated with female education. These effects might be partly accounted for in our reduced form estimates. In a sensitivity analysis we additionally consider the benefits of the cash transfer given to the mother on mortality of her children. We assume that about half of the cash transfer will be a pure windfall and use the estimates from Thomas (1990) on the impact of unearned incomes of mothers on the survival rate of their children in Brazil.

Costs

We will use the average costs of the PROGRESA stipend, which is about 6 percent of per capita income per child in Mexico per year. We apply this percentage to an average poor South Asian or Sub-Saharan African country; this percentage would translate to \$27. We add another 20 percent for administrative costs (although they were only 9 percent of program costs for PROGRESA, and 18 percent in the case of the Bangladesh stipend program), bringing the per-pupil yearly cost to \$32. With \$1 billion one could therefore support the schooling of 4.4 million children through the program for seven years. If one were to cover the entire eligible female population in the two regions, the annual costs would be \$6 billion in 2005, rising to \$7.3 billion in 2050 (in real terms). In a sensitivity analysis we also consider the additional costs of

supplying the education at another 20 percent of the costs of the transfer. Table 5 summarizes our full set of assumptions on costs and benefits.⁸

[Table 5 about here]

Table 6 shows the results for various scenarios; we apply high and low values of a DALY to the mortality benefit (after translating the reduction in child mortality into DALYs), for high and low discount rates, and for the 0.7 and the 1 year effect. We see benefit cost-ratios of between 3.00 and 26.12. Predictably, the effects are larger when the education effect is presumed larger. More interesting is that the highest effect always happens to be highest when a high DALY and a low discount rate are applied. This is due to the very large and relatively constant mortality effect. As the results in the bottom of Table 6 show, allowing for an additional 20% for increasing the supply while assuming that the cash transfer will have an immediate windfall effect in reducing mortality slightly lowers the benefit-cost ratios as the cost increase is larger than the benefit increase. But in all cases, the benefit-cost ratios remain very large.

[Table 6 about here]

Design and implementation issues

It is hard to imagine that such a program would immediately be implemented at a national scale. It would instead be prudent to roll out the program slowly, while constantly monitoring the effects on schooling quantity and quality, as well as other side-effects. It would thus be bets if initially the program would focus on population groups for which girls' enrollment rates are particularly low (basically the rural poor). Initially, it would focus on the 'average' rural poor for whom female enrollments in primary and secondary education are still low. As the program is expanded, it would then include harder to reach groups (where both costs as well as benefits may well be larger), such as girls living in remote areas, or in extremely poor families.

Note that in the spirit of the Latin American CCT programs this program would not only pay out to households in which girls are currently not in school but would be available to everyone in the target group (poor rural households) regardless of whether girls are in school or not, on the condition that they do attend school and stay in school. The PROGRESA program requires an 85% attendance rate which would be a useful benchmark.

There are several ways how one might be able to further enhance the cost-effectiveness of the program. First, one might extend the program just to groups and phases in education where enrollment rates are still low. This might mean that the program will begin with primary school girls in rural West Africa and only focuses on the last three years of secondary school in urban South Asia. Second, another way to enhance the effectiveness would be to focus the grants on difficult transitions such as the transition from primary to secondary schooling or to pay it out as a prize for secondary completion (Todd and Wolpin, 2006). Third one might want to allow the program to vary depending on economic circumstances. For example, the program

⁸ Coady and Parker (2004) estimate much larger costs in Mexico of both supply- and demand-side interventions at the secondary level. They estimate that achieving an extra completed year of secondary schooling for boys would cost 12,000 pesos for boys and 7,000 pesos for girls.

could be expanded in times of economic crises to prevent that girls are then taken out of school. Conversely, it could be curtailed during ‘normal’ times. Evidence from de Janvry et al. (2006) suggests that this might be an important function of such programs and they could be re-designed to strengthen this insurance function. Lastly, one might want to link the amount of the conditional cash transfer to performance at school. Evidence from a randomized evaluation in Kenya suggests that merit scholarships can lead to significantly improved test scores (Kremer, Miguel, and Thornton, 2004)

A last issue to investigate is whether and to what extent it would be necessary to pay funds to the schools to have an incentive to monitor attendance and to respond with expansion of the educational programs as a result of increased enrollments. The importance of such an accompanying intervention would probably depend on country circumstances and is hard to predict. The extent of expenditures needed will depend greatly on the institutional set-up chosen. Duflo, Dupas and Kremer (2007) show evidence that the hiring of substitute teachers on contracts in Kenya are not only much cheaper but also more effective in terms of educational outcomes than simply expanding the existing teacher pool at current conditions. This points to the need to carefully examine the institutional set-up for such interventions, as the cost-benefit ratios may greatly depend on improving them in the process of implementing these interventions.

Option 2 – Reduce women’s financial vulnerability through microfinance

The aim of this option is to improve women’s ability to earn income as needed or desired and thus reduce their financial vulnerability. As mentioned earlier in the paper, removing legislative and regulatory barriers to women’s employment or legislating measures that would allow more women to work can be a powerful tool—and one that has been used by many countries. In poorer developing countries, however, this tool has a much more limited scope for impact than in developed countries because the size of the formal or regulated sector is much smaller than the rest of the labor market. We thus focus on a policy option for self-employment. A significant number of women are employed in the informal sector, but most lack access to formal credit markets. Formal sector commercial banks focus on lending to larger business, while microfinance institutions (MFIs) cater to the informal sector and to women in particular. In general, three different types of lending services are provided by MFIs (Cull, Demirgüç-Kunt, and Morduch, 2007):

In *individual-based lending*, a loan contract involves one lender and one borrower who is liable for the loan (another individual may serve as a guarantor). These loans often require collateral, although borrowers who have a history of successfully repaying their loans often do not need collateral. In such cases, the promise of future loans (and often of greater amounts) provides sufficient incentive to the borrower to repay. MFIs, such as the Grameen Bank in Bangladesh, which have a significant number of members with successful repayment histories, are increasingly turning to this form of lending. Their average loan size is \$1,220, and the average subsidized share of funding is 11.0 percent.⁹

⁹ All values were derived using official exchange rates.

*Group-based lending*¹⁰ allows members to choose a group of peers with whom to join the program, so each borrower is responsible not only for her own loan, but also for the loans of the other group members. If any one group member defaults, all members become ineligible for further loans. Thus, collateral is replaced by group pressure in ensuring repayment. Examples include the Grameen Bank in Bangladesh and BancoSol in Bolivia. Their average loan size is \$431, and average subsidized share of funding is 27.7 percent.

In *village-based lending*, every branch of the MFI forms a single, large group which establishes its own form of governance. Examples include FINCA, Pro Mujer, and Freedom from Hunger. Their average loan size is \$149, and average subsidized share of funding is 35.5 percent.¹¹

The diversity of MFI programs makes it difficult to determine precisely how many programs exist, and how many borrowers they have. Depending on the definition, estimates of the number of MFIs operating today range from 300 to 25,000. The Microfinance Information eXchange (MIX), known as the “Bloomberg” of microfinance, reports nearly 1,000 MFIs worldwide, nearly half of which are self-sustainable. Estimates of the number of borrowers range from 30 million to 500 million, and millions more save with these MFIs. The Microcredit Summit Campaign reports over 64 million borrowers worldwide in 2006, up from more than 9 million borrowers in 2000 (Daley-Harris, 2006). As the number of borrowers has rapidly increased, MFIs have received more attention from the international community, and microfinance is increasingly viewed as an important tool for alleviating poverty. Indeed, the year 2005 was designated the “International Year of Microcredit” by the U.N. General Assembly (see www.yearofmicrocredit.org), and Muhammad Yunus received the Nobel Peace Prize in 2006 for founding the Grameen Bank, one of the first microfinance institutions.

There are a number of reasons for why the Grameen Bank and many other MFIs have focused on women. Firstly, they recognize that women who receive credit may command greater bargaining power in the household. A number of studies on Bangladesh have found this to be the case (Khandker, 2005; Pitt and Khandker, 1998; Pitt et al., 2003; Porter, 2007). And since women tend to be responsible for children’s health and education, this increased bargaining position for women within the household translates into a larger share of the household’s limited resources being devoted to children’s human capital.

Secondly, by supporting women’s entrepreneurial activities, women’s access to credit resources tends to increase also their labor force participation (Pitt and Khandker, 1998). Under standard neoclassical assumptions about the production function, if women have less access to capital than men, then the returns to capital for women should be higher than for men, and this

¹⁰ These are also termed joint-liability lending institutions (JLLIs).

¹¹ While individual-based microlending institutions show higher average loan sizes than MFIs using joint-liability lending, these larger average loan sizes imply lower costs and lower interest rates. Thus, on average, larger loan sizes are as profitable as smaller ones (Cull, Demirgüç-Kunt and Morduch, 2007). However, while individual-based loans average \$1220, village banks provide group loans averaging \$148. The latter are most dependent upon subsidies of the three aforementioned categories of institutions. The majority (88%) of village banks’ clients are women, whereas 46% of borrowers of individual-based loans are women.

higher return to capital could mean faster economic growth.¹² This holds true if women do not pass their loan funds on to their husbands (commonly referred to as “pipelining”), and provided that the loan funds are not regarded as perfectly fungible within the household.

Thirdly, there is considerable evidence that women have better repayment records than men. Khandker, Khalily, and Khan (1995) find that 15.3 percent of male borrowers in 1991 missed payments before the final due date, while only 1.3 percent of women did. Women may be more reliable in repaying loans because they are often less mobile, and as a result, may fear social sanctions more than men, may be more risk-averse, and therefore more conservative in their investment strategies. Due to inexperience in this area, women may also be more easily swayed by pressure from peers and loan officers.

Design and implementation issues

The impact of microfinance programs depends greatly on how they are designed, as well as the extent to which women have access to other forms of credit. For example, there are a number of different incentive-schemes for encouraging repayment which may affect men and women borrowers differently. Screening group members ex-ante, as well as monitoring ex-post, have been shown to play an important role in the success of joint-liability lending. Communication between group members raises default rates resulting from more risky projects. In contrast, repeat loans reduce both the borrowers’ incentives to engage in more risky activities, and raise repayment rates (Gine et al. 2006). Progressive lending, that is, increasing loan amounts over time, can also increase repayment by further raising the opportunity costs of default for borrowers (Armendariz de Aghion and Morduch 2005).¹³

In addition to repayment schemes, MFIs also differ in the training and other extension services they provide. While some MFIs such as the Grameen Bank focus primarily on providing financial services, others such as BRAC (also in Bangladesh), provide extensive training to borrowers. The evidence on whether such services are beneficial or cost-effective is scant. However, in a randomized control trial Karlan and Valdivia (2006) find that adding business training (about business knowledge, marketing strategies, use of profits, record-keeping) to a group lending program in Peru for female microentrepreneurs improved repayment and client retention rates. It is important that the clients find the training useful enough to outweigh its time costs.

As the microfinance industry grows, MFIs are increasingly competing with each other. During the industry’s early days, MFIs avoided direct competition with each other, often dividing up their clientele instead in order to maximize outreach with limited resources. With

¹² For example, Udry (1996) finds that productivity differentials in agricultural productivity in Burkina Faso are attributed to the intensity of production between plots cultivated by men and women, rather than to inherent skills differentials. This outcome is inefficient because of diminishing returns to fertilizer. Therefore, by providing women with credit, they would be able to purchase additional inputs.

¹³ Using household data across members of more than 262 Thai joint-liability groups, Ahlin and Townsend (2007) find that informal sanctioning, or ex-post reductions in moral hazard, reduce repayment in poor rural areas, while ex-ante screening, which reduces the risk of adverse selection, reduces repayment in wealthier regions of the country. Where borrowers have stronger social ties, or increasingly share information with unrelated group members and relatives, they are less likely to repay their loans.

informal moneylenders as their primary competitors, MFIs could rely on repeat and progressive lending to ensure repayment, as borrowers did not have good alternatives. More recently, however, in countries with more mature MFI sectors, such as Bangladesh, Bolivia and Uganda, MFIs are competing directly with each other. McIntosh, de Janvry and Sadoulet (2005) find that an MFI in Uganda experiencing more competition faces declining repayment rates, although participation is still rising. This suggests that many clients are borrowing from competing MFIs simultaneously. McIntosh and Wydick (2005) find that such competition can be bad for borrowers who become over-indebted and subsequently receive less favorable loan terms. This tendency for clients to be over-indebted may be mitigated through effective information sharing among lenders about clients' default behavior. A credit information sharing system can also make MFIs themselves more cost-effective. For example, Luoto, McIntosh and Wydick (2007) found that the introduction of a credit information system in Guatemala allowed MFIs to lower their break-even interest rate by more than 2.5 percentage points.

While MFIs have focused primarily on providing credit services to the poor, savings services have also been proven to be equally important in alleviating financial constraints of poor people. Non-formal financial savings instruments generally provide either security or returns, but not both, and poor people may even accept a negative return to ensure security.¹⁴ Because of liquidity constraints, MFI clients in Indonesia use credit as much for consumption as for investment purposes (Johnston and Morduch 2007). SEWA bank members in India also hold significant outstanding debt, in some cases far greater than their annual household income. This may be an additional cost to MFIs, and a reason for other risk-coping mechanisms besides loans, such as savings and insurance (Chen et al. 2005).

Ashraf, Karlan and Yin (2006a, 2006b) use a random experiment in the Philippines to assess the effect of a new product in which savers commit to restrict access to savings accounts until a specific self-set date or until they have reached a pre-committed savings balance. Only 28 percent of clients decided use this product, but those who did saw an 81 percent increase in their average savings balances over a 12-month period. While this effect was not sustained,¹⁵ the commitment product led to greater investment in durable goods preferred by women, such as washing and sewing machines, and kitchen appliances. The effect on decisionmaking power was strongest for married women who had below-median household decisionmaking power prior to the intervention, according to a survey instrument used in the study. For women above the baseline median, the positive effect was greatest for non-market goods such as children's schooling and the number of children.

In another study, Ashraf, Karlan and Yin (2006c) assess a program which provided door-to-door savings collection. The authors find that among those who used this service (15 percent of clients to whom it was offered), savings increased by 25 percent, while borrowing declined. This suggests that some borrowers do use savings for consumption smoothing rather than investment. Households who accepted the service tended to live farther away from the nearest

¹⁴ For example, Anderson and Bland (2002) surveyed hundreds of women in Kenya, an overwhelming majority of whom indicated that their primary reason for joining a ROSCA was to save.

¹⁵ After 30 months the average balance was only 33 percent higher compared to that of non-participants and the difference was not significant anymore; many clients did not use the account repeatedly.

branch, thus indicating the deterrent effect of travel costs, and were more likely to be married, again showing the importance of the time pressure in these households.

Benefit-cost estimates

The cost-benefit estimates discussed below are calculated based on microfinance programs that provide both credit and savings services. While studies have shown the importance of providing savings services to women clients, further study is needed to estimate the benefits that accrue to savers. Since the services were bundled together, it is not possible to determine the benefits or costs of each individually.

Benefits

Although there have been numerous studies of the impact of MFIs, relatively few of them have employed techniques to address selection bias. While targeting the poor may result in underestimated effects, results can also be overestimated since many microfinance clients already have initial advantages over their neighbors (Coleman 2002, Alexander 2001).¹⁶ In order to estimate the returns to microfinance, we use the results of a number of different studies which estimate the impact of MFIs on households and take considerable measures to control for selection bias. In particular, we use a number of estimates from a study on the effects of microcredit in Bangladesh which was conducted by the World Bank and the Bangladesh Institute for Development Studies (BIDS). Household panel survey data was collected in 1991/92 and 1998/99. We use the most recently available results in our calculations. The assumptions that underpin our estimates are given in Table 7.

[Table 7 about here]

Due to lack of similar information on other countries, we must make a significant leap in assuming that the results for Bangladesh hold also for other countries and for the next 100 years.¹⁷ For Bangladesh, Khandker (2005) finds that a 100 taka loan in 1991/92 increased household expenditures by 14.7 taka in 1991/92, and by 16.3 taka in 1998/99, while a 100 taka loan in 1998/99 increased household expenditure by only 4.2 taka in 1998/99.¹⁸ These findings

¹⁶ McKernan (2002) showed that not controlling for selection bias can result in the effect of participation on profits to be overestimated by as much as 100%.

¹⁷ It is important to note, however, that Bangladesh is one of the poorest countries where most rural women are subject to Islamic purdah laws and are often precluded from engaging in market activities and prevented from conversing with men who are not relatives. Nonetheless, Bangladesh has had a long history of microfinance directed towards women. One of the first microcredit programs ever established was the Grameen Bank in Bangladesh, and more recently, the microfinance market has become quite saturated, particularly in targeting the poor.

¹⁸ Khandker (2005) estimated significantly lower program effects than those found originally by Pitt and Khandker (1998). Pitt and Khandker (1998) addressed the causality issue using fixed effects and a quasi-natural experimental design to control for heterogeneity and selection bias at the household, individual and village levels. However, Morduch (1998, 1999) was critical of some key assumptions used in this study. For example, as a source of variation, Pitt and Khandker used the eligibility criterion of borrowers owning no more than half an acre of arable land, which Morduch argued was not strictly followed. Pitt applied robustness checks to show that any possible mis-targeting did not change the results much from those found in Pitt and Khandker's 1998 paper (Pitt 1999). Morduch also suggested an alternative method for estimating credit effects using the same survey data. While he estimated significantly lower credit effects, Pitt suggested Morduch was under-estimating the true effects (Pitt 1999).

may indicate diminishing marginal returns to borrowing. Using these results, we estimate that every new dollar loaned per year will raise household expenditures by 9.45 percent¹⁹ in the first year. Women who receive a loan in year 0 will continue to accrue benefits from this loan for the remainder of their life spans (assumed to be approximately 30 years), with an average annual increase in household expenditure of 0.98 percent.²⁰ This will hold for women who borrow in subsequent years as well. Thus, the benefits will accumulate considerably. We assume these benefits will continue to accrue for future generations and will reflect a permanent increase in household wealth as a result of this access to credit (see the Appendix for more details).

[Figure 3 about here]

Borrowing by women has been shown not only to raise household expenditures, but also to improve women's bargaining position within the household. As women invest more in their children, this increased bargaining can be seen in the improved health outcomes of their children. Pitt et al. (2003) find that credit to women increased height-for-age of girls and boys in Bangladesh. Duflo (2000) also finds that pension payments received by grandmothers in South Africa significantly improved the height-for-age z-scores of their granddaughters. Since height-for-age is a measure of malnutrition, we use the results from these studies to estimate a lower and an upper bound of the number of DALYs gained by a reduced number of malnourished children resulting from credit provided to women (see the Appendix for details).

Supply of loans

Again for want of more studies, we use the results for Bangladesh as parameters to estimate benefits. It is important, however, to keep in mind the scale of these programs, as there are different returns at different levels of lending.²¹ The average number of members reached by the Grameen Bank was 1.066 million in 1991, of whom 0.986 million were women, and 1.424 million in 1992, of whom 1.334 million were women (Khandker et al., 1995). To project the annual increase in borrowers in our estimates, we use the annual rate of increase in Bangladesh, 35 percent.

We assume that \$285 will be the average loan of every new borrower, based on the average loan size of village-based lending programs (\$149) and of group-based lending (\$431) (Cull, Demirgüç-Kunt, Morduch 2007)). This loan size is comparable to the average amount obtained by the World Bank/BIDS 1991/92 survey and used to estimate the benefits cited above (\$254.63).

Costs

While microfinance programs increase their members' access to financial services, they are very costly to operate and typically require extensive subsidies (Robinson 2001; Armendariz de Aghion and Morduch 2005). The full costs of these programs are partially recovered by the organizations themselves through interest income from loan disbursement and deposits with other banks and income from investments. Therefore, the social cost of a subsidized microcredit program can be measured by its negative economic profit, or the net subsidy allocated to the

¹⁹ This is the average of 14.7% and 4.2%.

²⁰ This is calculated as 16.3 minus 9.45, divided by 7 years between the two survey years.

²¹ See more on this in the section below.

program. This is also equal to the accounting profit net of the market cost of subsidized resources, including grants provided for training, research and monitoring (Khandker 1998, Khandker et al. 1995). Khandker (1998) estimates that the economic cost per dollar loan disbursed is \$0.172 for the Grameen Bank and \$0.444 for BRAC. While BRAC's costs are over 2.5 times greater than those of Grameen, the Grameen Bank disbursed nearly six times more in loans than BRAC. These differing costs may therefore reflect different economies of scale, but also may be partly explained by BRAC's emphasis on training its borrowers.²²

Bringing together our benefit and cost estimates, we obtain benefit-cost ratios that vary between 0.6 and 21.64, depending on the assumptions made (Table 8). The average benefit cost-ratio is 6.21. When we include the mortality benefits from improved children's health, and calculate estimates based on Duflo (2000), the benefit-cost ratio varies between 0.6 and 2.73, with an average of 1.70. This would be a lower bound. We also estimate an upper bound based on the results estimated by Pitt et al. (2003), where the benefit-cost ratios range from 2.06 to 21.64, with an average of 10.71.

[Table 8 about here]

Additional benefits

There are a number of additional benefits that we did not include in our estimates but which deserve some mention here. One has to do with effects on children's schooling. Pitt and Khandker (1998) find that both male and female credit participation in Bangladesh increase boys' school enrollment by similar magnitudes, while only female participation in the Grameen Bank seems to affect girls' enrollment. In contrast, a study on SEWA finds no effect on girls' schooling (Chen and Snodgrass 2001). Because of the contradictory evidence regarding the effect of microfinance on children's schooling, we exclude them from our estimates; if there were a positive effect, then our benefit-cost ratios would be underestimates.

Another potential benefit pertains to spillover effects to non-participating households. Since MFI's target the poorest or most vulnerable members of the population, the effects on non-participants may be considerably lower. Although there have been some attempts to estimate these effects, it would be difficult to generalize results to non-participants without an appropriate method for addressing the high selectivity of participation.

As we move up the income ladder and the enterprise size scale, borrowers show divergent characteristics and borrowing needs.²³ Coleman (1999, 2002) finds that wealthier

²² We have also examined data from 757 MFIs who have submitted their information on MIX (as of July 2007). All available data from 1998 through 2006 were used to approximate the costs of lending to women. Approximately, the average cost per dollar loaned is about \$0.20. Similar costs were also reported in the Spring 2007 MicroBanking Bulletin published by Microfinance Information Exchange, Inc.

²³ Cull, Demirgüç-Kunt and Morduch (2007) study a sample of 124 MFIs in 49 countries representing around 50 percent of all microfinance clients around the globe. While these are perhaps the more profitable and cost-efficient institutions, even in this select group, only half of the institutions were profitable and financially self-sustainable. One of the reasons for lack of self-sustainability might be lack of scale; only in eight countries do microfinance borrowers account for more than 2 per cent of the population (Honohan 2004). While a mature microfinance industry may be more self-sustainable, as MFIs grow and mature, they seem to focus less on the poor (Cull, Demirgüç-Kunt and Morduch, 2007), which could be interpreted either as a success story for their borrowers or as

borrowers in Northeast Thailand experience greater effects and he notes that this may be because they are less credit-constrained. One reason wealthier borrowers may have experienced larger impacts was because they could commandeer larger loans. Thailand is relatively wealthy, and villagers have access to credit from a range of sources. Village banks' loans may be too small to make a notable average difference in the welfare of households. In fact, Coleman reported that complaints about small loans led some women to leave the banks.

Thus, an important limitation of microfinance lies in scaling up to non-poor customers, and in particular, in the ability of MFIs to accompany their customers as they grow richer. Joint-liability lending relies on groups of borrowers with similar borrowing needs and the profitability of the approach relies on large numbers of borrowers and groups. As clients become wealthier, they will find they are limited by constraints other than credit, such as property rights and labor regulations. These issues will need to be addressed, as microfinance will not completely address poverty and gender inequality on its own.

Option 3 – Provide support for women's reproductive role

Women's reproductive role is broad, encompassing childbirth and a multitude of activities associated with infant and child care, and spanning 15-25 years of a woman's life. As we discussed above, motherhood is associated with serious risks to women's health, especially among the poorest populations. We choose to define this option as focusing on programs that reduce risks associated with fertility—preventing pregnancy, complications, and deaths due to these complications in pregnancy or childbirth (Graham et al. 2006). Its three components are *family planning programs for young women, support for safe births, and emergency contraception and related services*.²⁴

In this option, we make no assumptions about women's desired fertility levels, only that women should be able to access the reproductive services they need in order to have safer pregnancies and safer births. Although economic development is itself a potent factor in fertility decisions in that it increases the value of women's labor supply, raises demand for human capital investments in children, and reduces desired fertility, it works through the ability of women to use contraceptive methods (Schultz 1994). In Indonesia, Gertler and Molyneaux (1994) conclude that increased contraceptive use accounted for three-fourths of the fertility decline in Indonesia during the period 1982-87, but that this was mainly due to the fast rate of economic

mission drift. Targeting the poorest is more costly, but innovative program designs have combated this (e.g., ASA in Bangladesh; Banco do Nordeste in Brazil- channels many of its transactions through post office networks, reducing its costs and borrowers' transaction costs) (Littlefield, Morduch, Hashemi 2003).

²⁴ A growing number of countries have introduced emergency contraception since the ICPD; some have made it easier for women to access it, for example, by ending restrictions on over-the-counter sales. India, Iran and Nepal provide it through the national family planning programme. In the Dominican Republic, emergency contraception can be obtained through private pharmacies, while in Malaysia and Pakistan, NGOs are supplying it (UNFPA 2004). Programs addressing sexual violence often offer emergency contraceptive pills along with counseling to women who have been raped. In Chile, doctors and emergency rooms can distribute the pills to women who have been raped (UNFPA 2004).

growth at that time which opened up new jobs for young women in the labor market, not the increase in the supply of family planning services.²⁵

Estimates suggest that more than 130 million women or about 17 percent of all married women in developing countries would prefer to avoid a pregnancy but are not using any form of family planning; 64 million women are using less effective methods. Demographers refer to these women as having an “unmet need” for family planning, a concept that has influenced the development of family planning programs for more than 20 years (Casterline and Sinding 2000).²⁶ Demographic and Health Survey data in 53 countries reveal that in 16 of 25 countries outside of Sub-Saharan Africa, “unmet need” among married women is 15 percent or lower (Ashford 2003). In Sub-Saharan Africa countries, 16.2 - 37.9 percent of women say their need for family planning is not met, and current contraceptive use is lower than elsewhere. Thus, the total demand for family planning—defined as the sum of “unmet need” and current contraceptive use—averages 44 percent in Sub-Saharan Africa, compared with an average of 70 percent in Asia, the Middle East and North Africa, and Latin America and the Caribbean.

What are the barriers to contraceptive use among women who might want the services? In addition to the lack of accessible services, and shortages of equipment, commodities and personnel, other barriers are (Casterline and Sinding 2000, UNFPA 2004):

- Lack of method choices appropriate to the situation of the woman and her family. This can include shortages of support for and supply of temporary methods for birth spacing, the need to address cultural sensitivities (e.g., bleeding or spotting side effects where blood taboos are prevalent).
- Lack of knowledge about the safety, effectiveness and availability of choices; many women do not know the full range of available contraceptive methods that allow them to choose the method that best matches their circumstances and intention;
- Lack of community or spousal support;
- Side-effects for some, and insufficient follow-up to promote method switching and lack of knowledge on how to manage these side-effects; and
- Financial constraints.

During pregnancy, maternal problems arise from malnutrition. Appropriate interventions could include the provision of multivitamins, minerals, or macronutrient supplements, such as protein-energy supplements as well as iron and folic acid to combat anemia. While evidence of the impacts of such policies has been limited, Graham et al. (2006) find that interventions in addressing maternal health are more cost-effective if nutritional supplementation is included.

²⁵ This is similar to Pritchett’s (1994) conclusion that contraceptive use is an obvious proximate determinant of fertility and hence an important correlate of fertility, but contraceptive prevalence has no effect on excess fertility (or the fraction of births that are unwanted) and little independent effect on fertility, after controlling for fertility desires.

²⁶ Unmet need refers to women and couples who do not want another birth within the next two years, or ever, but are not using a method of contraception. Unmet need results from growing demand, service delivery constraints, lack of support from communities and spouses, misinformation, financial costs and transportation restrictions (UNFPA 2004).

The greatest risk to mother and child, however, occurs during childbirth, and various support services are needed then. Experts recommend the best way to combat such risk is to ensure that delivery services are provided by professionals skilled in obstetrics, both in health facilities and in homes. Health centers providing primary care are needed to provide prenatal care (including managing abortion complications), postpartum care, and care of newborns (Graham et al. 2006). Routine prenatal care includes screening and treatment of syphilis, immunization with tetanus toxoid, prevention and treatment of anemia, and prophylaxis or bed nets for preventing and treating malaria. Basic emergency obstetric care (BEmOC) should also be available but is highly dependent on the availability of supplies, drugs, infrastructure, and skilled health care providers. In case of need, a rapid referral communication chain is needed between district-level hospitals and the primary-care level. District hospitals must be able to provide surgical interventions and blood bank services. Lastly, routine physical examinations of postpartum women are critical, a difference from the focus on education.

Benefits

There are significant health benefits for women and their infants and the rest of their families from fewer unwanted pregnancies, fewer abortions, longer birth intervals, lower exposure to sexually transmitted infections and mother-to-child transmission of these diseases, and protection against ovarian cancer using certain contraceptives. Women who give birth in their 20's rather than in their teens and who space their births farther apart are less likely to have complications during pregnancy or delivery. They are better able to care for their infants, assume their home responsibilities or return to work more quickly. Moreover, costs associated with a health crisis are averted.

It has been estimated that meeting the needs of women for family planning programs would avert some 52 million pregnancies each year (half of which would be delayed to a later time, in accordance with stated desires) for an estimated annual cost of \$3.9 billion. Preventing or delaying these unintended pregnancies would also prevent (UNFPA 2004):

- 23 million unplanned births (a 72 per cent reduction);
- 22 million induced abortions (a 64 per cent reduction);
- 1.4 million infant deaths;
- 142,000 pregnancy related-deaths (including 53,000 from unsafe abortions);
- 505,000 children losing their mothers due to pregnancy related deaths.

Besides these health-related benefits, there are other benefits for increasing women's agency over their reproductive roles. Early, unplanned childbearing is generally negatively associated with girls' educational attainment. Whether or not this is a causal relationship is the subject of debate among researchers, but it is reasonable to assume that limited access to family planning services limits the ability of young women to exercise their reproductive choices, typically with direct consequences for their educational attainment, labor force participation, and earnings.²⁷ Just as changes in the opportunity cost of women's time influences desired fertility,

²⁷ It is also the case that early pregnancies matter most in countries where the average schooling levels extend into later adolescence (Eloundou-Enyegue and Stokes 2004). In contrast, in countries where the average duration of

so fertility affects women's work opportunities. A woman's capacity to perform physical labor is diminished during the period surrounding childbirth and child care; these intermittent or prolonged absences from the labor force reduce her cumulative work experience and also her wages.

There are consequences for children's future education and welfare as well (Graham et al. 2006). Healthier mothers are less likely to have infants of low birth weight, one factor that is significantly associated with child survival and illness as well as with later adult outcomes. For example, Behrman and Rosenzweig (2004) conclude that in the U.S. increasing birth weight increases adult schooling attainment and adult height, and among infants with the lowest birth weight, it also has significant labor market payoffs.

We use Levine et al.'s (2006) estimates of DALYs gained from family planning programs in East Asia and the Pacific, Latin America and the Caribbean, the Middle East and North Africa, South Asia, and sub-Saharan Africa, and those by Graham et al. (2006) of the benefits from maternal health programs. Their estimates reflect only the direct health benefits of these programs for women and children. While this policy option also has non-health-related effects, we limit our benefit estimates to health gains and therefore understate the benefit-cost ratios for the option. Lastly, we focus the analysis on countries in South Asia and sub-Saharan Africa in recognition of the large gender-related challenges in the two regions (Table 9).

[Table 9 about here]

Costs

To cost this option, we consider two components—the average cost of family planning programs and the cost of maternal health programs. Different family planning programs are associated with different costs. For example, IUDs and voluntary sterilization have the lowest cost per CYP (couple-year of protection), but the highest fixed costs. Oral contraceptives are generally the least costly, and implants are the most costly. In general, costs per CYP are considerably higher in Africa (\$14 compared to \$4 to \$5), but the marginal benefits are also considerably higher because of the significant unmet need (Levine et al. 2006). And while marginal costs decline as the number of contraceptive users increases, so may the marginal returns to increasingly mature programs.

For the maternal health programs, we consider a number of specific program options following the analysis by Graham et al. (2006). These are:

- Routine maternity care consists of having 50 percent of pregnant women attend prenatal care, 50 percent receive professional intrapartum care, 20 percent of the complicated cases being referred to the secondary level of care, of whom 50 percent receive needed CEmOC (comprehensive emergency obstetric care).
- Improved overall quality of care, with nutritional supplements, consists of the same coverage as routine maternity care, but provides enhanced prenatal and delivery care (BEmOC); 20 percent of the complicated cases that have received this primary level of

schooling is short or where reproductive norms prescribe early marriage and childbearing for girls, the absence of family planning programs would not be a binding constraint to fertility behavior.

care are referred to the secondary level, of whom 70 percent receive needed CEmOC, including interventions for high-risk babies.

- Improved overall quality of care without nutritional supplements
- Expanded primary-level coverage means coverage increases to 70 percent of women receiving prenatal care and 70 percent receiving care during delivery.
- Improved overall quality of care and coverage, with nutritional supplements is the expanded primary-level coverage, plus 50 percent of the complicated cases are referred to the secondary level of care, of whom 90 percent receive needed CEmOC.
- Improved overall quality of care and coverage, without nutritional supplements

In our estimates, we assume that the number of years needed to eliminate unwanted fertility and unsafe abortions would be 14 years in South Asia and 43 years in sub-Saharan Africa. This is based on applying the total percent decline of 53 percent (from 6 to 2.8 children per woman)²⁸ in the fertility rate in developing countries over the past 50 years—which translates to an annual decline in the fertility rate of 1.07 percent—to the fertility rates in South Asia and sub-Saharan Africa, 3.3 and 5.2 respectively. Over the course of 14 years in South Asia and 43 years in Sub-Saharan Africa, we assume that family planning programs would be implemented along with maternal health programs, and that the benefits would take place in the same year as the intervention. Thus all estimates were discounted and summed up over the course of these years.

Because the take-up rates of these programs will not be universal, especially in the beginning, we assume that public communication or advocacy campaigns would be needed to influence demand. These campaigns have, in fact, been used extensively to promote reproductive rights and service utilization of family planning programs (Graham et al. 2006), and we use the information about costs and results from past large public information campaigns in our cost estimates. These campaigns were designed to change individual behaviors that are grounded in social structures and cultural norms, by changing the knowledge base, the attitudes, intentions and behavior of an intended target population. In general, past studies conclude that spending on promotion was a better predictor of fertility rates than spending on contraceptive supplies. In addition, it appears that the benefit-cost ratio increases with time, a gain of 76 percent in the cost-effectiveness ratio to 3.16 for print media in a promotional campaign in Brazil (Foreit et al., 1989), suggesting that the diffusion of information takes time. Studies that have measured the impact of media campaigns to promote contraceptive use put the cost per new contraceptive user between \$1.36 and \$3.57 (in 2001 dollars).²⁹ Using these estimates, we assume two possible

²⁸ We assume that an appropriate goal of a fertility rate of 2.8 births per woman is more reasonable in this case than the much lower average fertility rate for developed countries. Since family planning programs such as those proposed here have proven successful in other developing countries, but only insofar as reaching the 2.8 TFR, a lower rate would perhaps be too unrealistic as a goal for South Asia and sub-Saharan Africa.

²⁹ For example, in Egypt, in the late 1980s a multimedia campaign emphasized the use of the electronic mass media and specifically television to promote family planning (Robinson and Lewis 2003). Over 90% of urban and 70% of rural households owned a TV set in 1992. The mass media campaign was well received by the public and aroused no serious opposition. Using data for the 2 years covered by these campaigns, it appears that 12 million

costs for a promotional campaign for family planning, a low cost scenario of \$1.30 per contraceptive user and a high cost scenario of \$3.50 per user. Using also the proportion of all women with unmet need for family planning—in Sub-Saharan Africa, 19.4 percent, and in Asia, 13 percent (Levine et al. 2006), we estimate the increased number of contraceptive users due to the promotional campaign.

Benefit-cost ratios

Table 10 shows a wide range in the benefit-cost ratio for alternative forms of this option. Combining the benefits and costs of the family planning program with maternal health programs, the benefit-cost ratio varies from 7.77 for the program that offers also prenatal and delivery care, assuming a high cost promotional campaign for family planning, to 10.63 for the routine maternity care program and low cost promotional campaign (both using the lower value of DALYs and the lower discount rate of 3 percent). Given that the scenarios presented do not vary in terms of the length of the period during which costs are incurred or benefits are gained, the ranking of the alternative programs stay the same across the scenarios.

[Table 10 about here]

The effectiveness of many of the programs considered depends crucially upon the degree to which several design and implementation issues can be addressed, including availability of skilled personnel, effectiveness of referral systems, surveillance, and better access to the poorest women (Graham et al. 2006). The cost-benefit analysis relies heavily on the results of the cost-effectiveness analysis done by experts of the Disease Control Priorities Project (2006). The cost-effectiveness of the provision of maternal care services and family planning programs were estimated separately. However, integrating the two types of services is likely to be more efficient than offering separate programs, since costs would be distributed jointly across services (Levine et al. 2006). For example, less profitable contraceptive services can be cross-subsidized by clinics that also provide services such as Papanicolaou smears, ultrasounds, pregnancy tests, abortions, and post-abortion care.

In order to reduce maternal risk factors, the aforementioned health system improvements will not be sufficient. Social, cultural, and economic factors also play an important role, as do reproductive rights (Graham et al. 2006). Ten countries have adopted family laws and legislation to make men more responsible for reproductive health. For example, the Lao People's Democratic Republic has adopted a national birth-spacing policy, reversing a pro-natalist policy adopted in the 1990s. Under the new policy, contraception is provided for free and without coercion. Belize's National Health Policy outlines reproductive rights, including voluntary counseling and testing for HIV infection; ensures tax exemption for NGOs that provide health services; and sets protocols for family planning services. As mentioned earlier, in Papua New Guinea the requirement for a "husband's consent" for contraceptive use has been removed.

Egyptian pounds were spent on the campaigns—or about £E10 (about £E17.00 or US\$3 in current prices and current exchange rate) per added family planning user, ignoring the additional impact of these expenditures on knowledge and approval of future new users. In other words, it cost an average of US\$3 of television broadcasts to give a person sufficient knowledge and motivation to lead them to seek out and adopt a method of contraception.

These legislative reforms remove some of the social barriers that stand in the way of women making choices that are good for them and their families.

Option 4 – Strengthen women’s political voice through affirmative action

Institutional reform is important to promote gender equality in many areas, but five areas stand out—family law³⁰, protection against violence³¹, land rights³², labor laws³³, and political rights. Social, legal, and economic institutions together underlie observed gender inequalities and are barriers to reducing those disparities. Institutional reform that promotes gender equality must be the first element of a strategy to engender broad-based, sustainable development. In the short run societal institutions are difficult and slow to change; yet, even dramatic transformation is possible—though often in the face of great resistance and at high cost. Gender-related institutional reform can have a profound impact on the decisions and behaviors of individuals and households. Our fourth option focuses on reforms that would expand women’s political voice in society. Most countries’ statutory codes give women the right to vote and to hold political office, but the numbers discussed earlier indicate that gender inequalities in political representation are large.

This policy option consists of three components. The first is *to legislate political reservation for elected executive and legislative positions in government, especially at subnational or local levels*. Gender quotas are a fast-track approach to expanding women’s presence in the political arena. In general, political selection in many countries is based on economic advantage and political connections – politicians are more likely to be educated, own land, and have family political connections (Besley, Pande and Rao, 2005). At the national level, even in the most gender-unequal countries, a few women are able to ascend to high political positions, but typically by virtue of their elite socioeconomic class and relationship to male politicians. It is important, however, to begin at subnational levels where novice female

³⁰ *Family law*, whether based on statutory, customary, or religious law, establishes the level of autonomy and control women and men have in family matters, including marriage, divorce, child custody, control of conjugal property, and inheritance of property. Inequalities in family law directly affect women’s welfare; they weaken women’s bargaining power in the household which can have important second-round effects on family welfare.

³¹ *Protection against violence*. In many countries laws that ostensibly protect women from gender-related violence contain biases that discriminate against the victims or that render the laws ineffective. Often these laws define violence in very narrow terms or impose burdensome evidentiary requirements. The first goal of legal reform would be to identify and correct gender biases in existing laws, such that violent behavior becomes more costly to the abuser.

³² As discussed earlier, equal access to and control of land resources is important for several reasons. Insecure land rights can reduce female farmers’ productivity and inhibit women’s access to credit, since land is an important form of collateral. Land reforms that provide for joint titling of husband and spouse or that enable women to hold independent land titles can increase women’s control of land where statutory law predominates. Where customary and statutory laws operate side by side, their interactions must be taken into account if efforts to strengthen female access to land are to succeed.

³³ Labor laws that restrict the types of work women can do or limit the hours they can work, even when couched as “special protection,” restrict women’s access to the labor market. Such legal restrictions should be eliminated. At the same time, equal employment and equal pay legislation can help form the basis for equal rights and equal protection in the labor market. But such legislation may have limited impact in the short run—both because large numbers of female workers remain in informal sector jobs and because adequate enforcement may be lacking.

politicians can acquire relevant experience and build their constituency at a more realistic scope and pace.

There are other reasons for a focus on women's participation in subnational or local governments, instead of MDG5's focus on the share of women in national parliaments. One is that over the last two decades, decentralization has been a major institutional reform in a large number of countries in Latin America, Asia, and Africa, including the two most populous countries of the world, China and India. These reforms have shifted major decisionmaking responsibilities about revenue collection and public services to local governments and communities, so more is at stake at the local level. For example, China's decentralization policy stipulates multiple layers of service supervision involving national agencies with oversight functions as well as corresponding agencies in country and village governments. India's decentralization law in 1993 gave the Gram Panchayat (GP) primary responsibility in allocating government funds to development schemes it defines and implements, including welfare programs (such as antenatal care and childcare for pre-school children) and public works (drinking water, roads, housing, electricity, irrigation, education) (Ghatak and Ghatak 2002, Besley, Pande and Rao, 2005). In principle, India's GPs have complete flexibility in allocating these funds and make decisions by majority voting.

In addition, there are more opportunities for leadership by women at the community level. Self-help women's groups have mushroomed throughout the developing world, constituting a good training ground for female leaders and a potent political base for women who decide to enter politics. According to the 2005 Afrobarometer data on the participation of men and women in various types of organization, rural women are at least as likely to be active members or leaders in such organizations, suggesting that in Sub-Saharan African countries rural women are accumulating experience as organizational leaders (Table 11).

[Table 11 about here]

Lastly, many governments have already taken steps to mandate minority representation in legislatures, including quotas for women in parliaments or in local governments or quotas for parties' candidate lists for legislatures. For example, Argentina pioneered a candidate quota law more than fifteen years ago, in 1991. Though the law was initially ridiculed by men, the current female membership in the National Congress is the highest ever attained—42 percent in the Senate and 33 percent in the House, and the country just elected its first female president. The policy spread across the region, and by the end of the decade, ten other Latin American countries had adopted legislative quotas, and an eleventh, Colombia, introduced them for senior executive appointments.

In India, political representation was mandated for women in local governments (Gram Panchayats)³⁴ through the 73rd amendment to the federal Constitution in 1993. The amendment established the framework of a three-tiered local government system, with regular elections every five years, devolving power over rural public works and welfare services from the states to the GPs throughout India. Reservation has drastically increased the number of women in the

³⁴ Gram Panchayats, or GPs, are village councils which encompass 10,000 people and serve as India's vehicle for decentralized provision of public goods in rural areas.

village councils: In two states, West Bengal and Rajasthan, in reserved GPs, 100 percent of the Pradhans are female, while in unreserved GPs the percentage of women Pradhans is much smaller—only 6.5% in West Bengal and 1.7% in Rajasthan (Chattopadhyay and Duflo 2004). In Bangladesh, in 1997 women received the mandate to be directly elected to the Union Parishad (UP), local government institutions, through three reserved seats in each UP. This was the culmination of a groundbreaking initiative in 1978 to include two women as nominated members of the UP; this number was raised to three in 1983. In 2002 there were over 12,800 elected women members in 4,198 UPs throughout the country (World Bank 2007). Under the current government, Pakistan reserved one-third of seats for women in all three tiers of local government and 17 percent in the national and provincial legislatures. These reserved seats are filled through direct election at the union council level and indirect election at the tehsil and district level. At the national and provincial level, a proportional representation system has been adopted to fill the reserved seats for women. The reserved seats brought more than 40,000 women to local governments and 205 to the national and provincial legislatures.

In Uganda, the 1997 Local Government Act provided for one-third reservation for women on all local councils (LCs, previously Resistance Councils). Namibia also adopted quota laws for parliamentary and municipal elections in the mid-1990s; as a result, women's representation in parliament rose from single digits to 28 percent during 1990-2003.

And in 2000 the French parliament approved a law requiring that parties field an equal number of male and female candidates in legislative elections. In cities of more than 3,500 inhabitants where the parity law was applied, women's presence on municipal councils rose to 48 percent.

A second component of this option is *to launch and maintain for at least 30 years a nation-wide, systematic public information or advocacy campaign in support of the above policy*, not unlike the information campaigns in many countries about family planning, HIV/AIDS prevention, and smoking. It is hard for women to win elections, partly because voters believe female politicians are less effective, and partly because women do not have the experience to win elections. Affirmative action opens up some very real threats to women; inevitably, conflicts emerge between men and women and possibly even between older and younger women who have different expectations and understanding of gender roles. Because women sometimes face a backlash, social and economic reprisals for violating stereotypes regarding the role of women (Rudman, 1998), reservation and public information campaigns should remain in place for a long time.

There is evidence of the need for a sustained public information campaign. In Bangladesh, the women members of the UPs faced serious problems in carrying out their functions due to resistance by the chairman and other members. In Pakistan, women councilors across the three tiers of local government faced similar institutional and social constraints to perform their roles effectively. They were ignored, treated them with contempt, denied development funds and expected them to confine themselves to “women's issues” (citation here). In India, respondents in a survey were systematically less likely to declare satisfaction with the public goods they were

receiving in villages with female *pradhans*.³⁵ Particularly striking is the fact that individuals were less satisfied with water service, even though both the quality and quantity of drinking water facilities were deemed higher in reserved villages. This performance assessment of female leaders is similar to the results of laboratory experiments in the United States and Western Europe which suggest that women leaders are often evaluated more negatively than male leaders, holding performance constant (see Eagly and Karau 2002 for a survey). Women are typically judged to have less leadership abilities than men with similar characteristics, and the same actions performed by men and women in leadership situations are evaluated more negatively when women are the leaders.

A sustained public information campaign has the potential to reach and motivate substantial number of audiences in developing countries. Nationally representative Demographic and Health Survey data from various countries reveal that men and women are already exposed to different communication channels. They are more likely to listen to the radio or watch television once a week than to read a newspaper, so broadcast media are potentially the most effective communication channels for a public information campaign in a wide range of settings (Table 12). Evidence from evaluations of different media campaigns demonstrates the power of communication media in changing social behaviors.³⁶ For example, a newspaper campaign in Uganda was used to reduce capture and corruption of public funds by providing more information to schools and to parents about the government's school grant program (Reinikka and Svensson, 2004). A review of studies that measure the effectiveness of 24 mass media interventions in developing countries on changing HIV-related knowledge, attitudes and behaviors (published from 1990 through 2004) showed effects on a variety of outcomes (Bertrand et al., 2006).

One example of such a campaign for women's political participation is India's experience with the Society for Participatory Research in Asia (PRIA), a non-profit development organization in New Delhi. PRIA launched a Pre-Election Voter's Awareness Campaign in 16 districts of Rajasthan with the objective of creating an enabling environment for free and fair elections and advocate for women representatives. It used a large variety of communication methods such as folk theatre, puppet show, slogan writing, participatory videos, audio cassettes, distribution of pamphlets and manuals, a bicycle rally, march, and small group meetings. On the

³⁵ In India, a proposed amendment that would ensure a 33 per cent quota for women in parliament has not been passed. Despite constitutional guarantees of gender equality, the women's reservation bill has failed to become law; though female parliamentarians seem united in their support for the bill, male parliamentarians have united against the bill. Gender as a cohesive force exists, among women politicians, but is weak because they are, as a group, small in number.

³⁶ The public information campaign could use a communication model similar to that described by Figueroa et al. (2002). In this model a catalyst (i.e., a particular trigger, such as a political reservation law) starts the community dialogue about a specific issue of concern or interest to the community. If effective, this dialogue leads to collective action and the resolution of a common problem. The catalyst is necessary because the community does not *spontaneously* initiate dialogue and action. An alternative approach to a public information campaign is the use of opinion leaders as change agents through diffusion (see review by Valente and Davis 1999), but this interpersonal approach is also often aided by mass media and other communication strategies. This approach uses the existing information dissemination network within the community. Rotating credit associations in developing countries are an example of a community group that follows this approach.

whole, popular communication methods (pamphlets, posters, and pictures) and group meetings were found to be more effective for reaching women than the mass media (PRIA, 2000; IDS 2001).

[Table 12 about here]

The third component of this option is to invest in leadership and management training programs for female politicians and political aspirants at the subnational or local level. The objectives are to help female local politicians be better able and more confident to fulfill their responsibilities. A majority of women who enter government for the first time often lack sufficient understanding of laws and formal bureaucratic procedures, do not have experience engaging in political discussions, and do not have a ready network of colleagues. In many cultures the long-held norm is that men, not women, attend community meetings, and if women do attend, they do so without speaking. It is not surprising that the female pradhans in India who hold reserved positions have little political experience prior to the 1998 election. Eighty-nine percent of them (as compared with 57 percent of male pradhans) had never been elected to a panchayat position and most had not even participated in any panchayat activity (Chattopadhyay and Duflo, 2004). But increasing the probability that a woman enters politics raises also the personal returns of investing in political skills, so this program need not fund experienced female politicians. Many countries have training programs for government officials and managers, but a training program that is targeted to help women who are less educated, who belong to disadvantaged groups, or who are in local politics for the first time would be more suited to these novice politicians.

Benefits

The first direct effect of political reservation is to give voters the opportunity to assess the ability of women as political leaders, thereby helping to change male and female attitudes towards women leaders. Indeed, early successes by women as policymakers and political players will not only improve their own abilities but likely also motivate other women to vie for political positions in the future, thus making for a sustainable reform. We have already mentioned above the increase in the number of women politicians in the countries that adopted laws mandating political reservation. In addition to women holding more political positions, the reform has also increased the general participation of women in political activities or events. For example, reserved GPs with women pradhans in West Bengal have on average 21 percent higher women attendance at the biannual general assemblies relative to the unreserved GPs (Chattopadhyay and Duflo, 2004). In addition, the share of women speaking at these assemblies is 13 percentage points higher in GPs reserved for women (Beaman et al., 2005). And while on average, a woman speaking at these meetings is 14 percentage points more likely to receive a negative response than a man speaking, in unreserved GPs this likelihood is higher at 25 percentage points.

Besides giving women greater voice in government (a “rights-based” view), does greater political representation by women change the content of policy decisionmaking? If yes, what are the consequences of the change? Some studies conclude that men and women have different policy preferences, with women more likely to support women’s policy preferences. In the U.S., for example, women legislators are said to be more likely than men to take liberal positions across a number of social issues, in particular spending on child care and other child related

expenses (Edlund, Haider and Pande 2003). Not surprisingly, some research also finds that a higher proportion of female representation within a legislature increases the amount of legislative attention to female policy priorities, though not necessarily to policy outputs (Crowley 2004; Schwindt-Bayer and Mishler 2005). In Uganda, women parliamentarians at the national level showed their capacity to promote gender-equity legislation by passing an amendment to the penal code in 1990 that made rape a capital offence. Similar findings are probably forthcoming from developing countries that have mandated political representation by women, but for now our discussion is limited to the empirical evidence provided by several studies of India's reform at the panchayat level (Pande 2003, Banerjee et al. 2004, Chattopadhyay and Duflo 2004, Beaman et al. 2006). Because of the randomized way in which the rotation of reserved GPs had been designed, India's reform constitutes a large social experiment that can be evaluated rigorously. Specifically, a comparison of the reserved and unreserved GPs provides direct evidence of a causal relationship between political reservation for women and development indicators.

To predict the total benefits from this option, we combine the India-specific results about the (first round) impacts of political reservation with findings from other published studies about the second-round effects of the reform in terms of income growth and DALYs gained. Admittedly, applying the India results to the developing world as a whole is a far-reaching assumption, but one that we take because of the absence of better data in developing countries. Our estimates should then be interpreted as an illustration at best, keeping in mind that the few other studies we have cited provide corroborative, though largely qualitative, evidence. Our assumptions about the channels of the benefits are contained in Figure 5.

[Figure 5 about here]

With respect to the development benefits from an increase in women's political participation, the evaluation studies of India's policy experiment (already cited above) indicates the following:

- *Water supply & public health.* In West Bengal, there are significantly more public drinking water taps and hand-pumps when the GP pradhan position is reserved for a woman, and there is also evidence that the drinking water facilities are in better condition (though this coefficient is not significant at the 5% level) (Chattopadhyay and Duflo, 2004). The supply of safe drinking water is higher in reserved GPs than in unreserved GPs by 0.95 percent. A meta-analysis of the literature on the impact of safe water supply, sanitation and hygiene promotion estimates the resulting reduction in the burden of diarrheal disease, to be in the range of 41,993-51,358 DALYs gained (Caincross and Valdmanis, 2006). We use the lower number which the authors regard as the realistic estimate for estimating the benefit from more investments in water supply.³⁷

³⁷ For example, in India, diarrhea prevalence amongst infants in families with piped water is twice as high for those in the poorest quintile than the richest. Access to piped water significantly reduces diarrhea prevalence and duration. Disease prevalence amongst those with piped water would be 21% higher without it. Illness duration would be 29% higher. Safe water supply is defined as a household with access to piped water either via a tap in the premises of the household or from a public tap nearby (Jalan and Ravallion 2003).

- *Child immunization.* A child between the age of 1 and 5 residing in a village reserved for a female pradhan has 2 percentage-points higher probability of having completed all five vaccinations in an immunization program (Beaman et al., 2005). This could be the result of an improvement in the quality of service of health workers in reserved GPs. In Rajasthan health care providers are less likely to be absent from work in health facilities in villages reserved for women, and they are more likely to have visited villages in reserved GPs (Banerjee, Deaton and Duflo, 2004). In West Bengal, teams of mobile health workers are more likely to visit the villages in reserved GPs than in unreserved GPs (Chattopadhyay and Duflo 2004). Moreover, better public service does not seem to come at a higher price: Both men and women are significantly less likely to have to pay a bribe to obtain a service if they live in a GP where the position of pradhan is reserved for a woman (Beaman et al., 2005).
- *Early childhood development.* In reserved GPs preschool children are 2 percentage-points more likely to attend an *anganwadi* (community child care center) which provides child feeding and care (Beaman et al. 2006). From a review of the impact of different ECD programs, community-based child centers would seem to have the following effect sizes on cognitive development of very young children: 0.37 of a standard deviation in Bangladesh, 0.4-1.5 in Bolivia, 0.66 in Guinea, 0.5-1.8 in the Philippines, and 0.25 in Vietnam (Engle et al., 2007).
- *Roads.* In reserved GPs, the condition of rural roads has been found to be 0.21% better (Beaman et al., 2006). To assess the implication of this impact, we use the results of an evaluation of a rural road rehabilitation project in Vietnam. We note that improving roads raised the availability of employment opportunities for unskilled labor by 11%, the number of upper secondary schools by 17%, and the primary school completion rate by 15-25% (Mu and van de Walle 2007). The results change when impacts are measured after another two years; only those on the primary completion rate are sustained through to the medium term, so we include only the benefits on schooling. A number of new outcome indicators reveal significant impacts in the longer run, such as markets becoming newly available, but we ignore these potential second-round benefits.

We use the above results to estimate the expected benefits from this option. We focus only on selected benefits, ignoring additional benefits that the studies have suggested. For example, because the effect of reservation on spending on other public goods, including the supply of informal education centers and transportation, is either insignificant or opposite in sign in West Bengal and Rajasthan, the two states evaluated, we attempt to offset these losses by including only the benefits from more drinking water taps and assume that the benefits from more hand-pumps and better water quality fully *offset* the losses to the community of a negative (even when insignificant) impact on education centers and transportation. We also exclude all second-round benefits, such as the gains from improvements in cognitive development raising the educational attainment of the next generation. Thus, we opt for a more conservative estimate of benefits. Table 13 provides a summary of these assumptions.

[Table 13 about here]

Costs

The introduction and implementation of political reservation has social costs. There will be costs to male politicians who will have fewer seats to compete for in each election, and so the cost of being elected will be higher for them. People who hold beliefs contrary to the reform are likely also to be dissatisfied and they might actively or passively resist the reform. We presented evidence above that female politicians tend to receive a more negative assessment than men for the same level of performance. Lastly, as with affirmative action policies in the labor market, there may be short-to-medium-run productivity losses associated with electing women into office who have little or no knowledge or experience with policy decisionmaking and government functions (this assumes that the productivity loss is actually significant). Estimating these costs directly is a difficult task; the evaluations of affirmative action policies such as India's social experiment with reserved seats do not provide cost estimates of the successful passage and implementation of legislative reforms.

To estimate the costs associated with this option, we estimate what it would take to reduce the costs to the "losers" (e.g., male politicians) under political reservation. We include two types of cost—the cost of dissolving the resistance of the "losers" through public information campaigns, and the cost of improving the productivity of new women politicians through training programs. With respect to the former, we assume that the legislation instituting the political reservation requires preparation, including lobbying politicians to initiate and pass the legislation and persuading citizens through five years of a public information campaign. Moreover, we assume that the advocacy campaign, in various forms, should not stop with the passage of the law but should be sustained over a period of 30 years or more. If the historical experience of the industrial countries with respect to electing women into political positions is a good indication of what it would take to change the hearts and minds of citizens, including women, then it would take at least a generation to approach gender equality in local government positions.

A public information campaign would include the development of campaign material, publicist costs (for arranging media coverage), and publication costs. There will be choices made about which mass media network to use—print, radio, television, Internet/new media delivery. Studies suggest that radio communication may be the most cost-effective, where cost-effectiveness is defined here as the cost per program outputs and outputs are the number of women and men reached by the campaign and any change in perception and behavior by those reached by the campaign. For example, in Tanzania, women who recalled radio messages about family planning were 1.7 times as likely as women who reported no exposure through radio programs to have discussed family planning with their spouse and were 1.9 times as likely to have been currently using family planning (Jato et al., 1999). Media experts indicate that television production costs from 4 to 10 times more per minute than radio (Booz Allen Hamilton 2006). To estimate costs, we consider information about costs and results from large public information campaigns related to family planning programs and health programs.

In addition to the cost of a public advocacy campaign, costs include the costs of training potential women leaders. To derive these estimates, we assume that only women who are between the ages of 25 and 59 will be eligible for training and that only roughly 2-5% of them

would be interested in being elected, based on the Afrobarometer data on the percent of women who were active as leaders in community organizations. We also assume that of these women, only one-fifth can be given training each year, that any woman can attend more than one training spell, and (tentatively for now) at the same average annual cost as providing basic education, without specifying the duration of the training or the opportunity cost of attendance.³⁸ Table 13 summarizes these assumptions.

Benefit-cost ratios

We estimate benefit-cost ratios for two principal scenarios. In one scenario, a 30-percent share of women in local political positions would be achieved in 20 years and gender parity, defined as a 50 percent share, in 30 years. In a second scenario, it would take longer to raise women's political representation—30 years to reach 30 percent and 45 years to reach gender parity. We note that at least in terms of national parliaments the Nordic countries are at just under gender parity, whereas other countries are at a far lower percentage.

Because of the generally long horizon in achieving the goals for this option, our benefit-cost ratio estimates are quite sensitive to our choice of discount rate. The estimated ratios range from a low of 2.3 to a high of 17.7 for the “fast” scenario and from a low of 1.7 to a high of 12.0 for the “slow” scenario. These estimates are presented in Table 14.

[Table 14 about here]

Design and implementation issues

How might this option work? Below we briefly discuss key features of the reforms in India and Uganda in order to illustrate some of the design and implementation issues that reformers will need to address.

India

The setting up of the Committee on the Status of Women in India (CSWI) marked the start of a movement for greater representation of women in politics in India. Its 1976 report suggested that women's representation in political institutions, especially at the grass-roots level, needed to be increased through a policy of reservation of seats for women. In 1988, the National Perspective Plan for Women suggested that a 30 per cent quota for women be introduced at all levels of elective bodies. Women's groups insisted that reservation be restricted to the panchayat (village council) level to encourage grass-roots participation in politics. The consensus around this demand resulted in the adoption of the 73rd and 74th amendments to the Indian Constitution in 1993.

The 1993 amendment included mandates to ensure that GP budget decisions were representative of the preferences of the community. First, GPs must hold a general assembly every six months to report on activities and submit the proposed budget to voters for ratification, and pradhans must have regular office hours to allow villagers to formally request services and lodge complaints. Second, states are required to reserve one third of all council seats and pradhan positions for women. Since electoral rules ensure that GPs to be reserved for women are selected

³⁸ We are searching for better estimates of the training costs.

at random and that reserved seats cycle among GPs evenly, any difference in outcomes in reserved and unreserved GPs can be confidently attributed to the reservation policy. Reservations for women have been implemented in all major states except Bihar and Uttar Pradesh (which have only reserved 25% of the seats for women in the 1995/96 elections).

In 1995, the question of quotas in parliament was raised again. Initially, most political parties agreed to this proposition, but when the bill addressing this issue was introduced in the Eleventh Parliament in 1997, several parties and groups raised objections. The objections focused on two main issues: the issue of overlapping quotas for women in general and those for women of the lower castes; and the issue of elitism because most women's groups felt uneasy about giving special privileges to elite women by ensuring seats for them in the parliament. Most women MPs have supported the 81st Amendment, which would ensure a 33 per cent quota for women in parliament, even though party discipline has not allowed them to vote for this. (Rai, 2002; Narasimhan, 2002).

Uganda

The way the one-third reservation for women was implemented in the 1997 Local Government Act implies ambiguities about the constituencies they are supposed to represent. The one-third reservation has not been applied to existing seats in local government councils. Rather, except at the village level, the number of seats on all local councils has been expanded by a third to accommodate women. In effect, the reserved seats do not disturb established competitions for ward seats; instead, these reserved seats represent clusters of two to three wards, in effect at least doubling the constituency that women are meant to represent, compared to regular ward representatives. Until 2002 these elections were not by secret ballot but by voters physically queuing up behind the candidate they support; this was finally changed to a secret ballot at the district level in time for the 2002 local council elections. In addition, the elections for the women's seats are held separately, a good two weeks after the ward elections, reinforcing the sense that they are outside regular politics. In the 1998 local government elections, this system failed to attract enough voters for the women's elections all over the country, putting in question the perceived legitimacy of the elected women (Ahikire 2001).

Similar ambiguities and constraints afflict the women in the 53 reserved district-level parliamentary seats (Goetz 2002). The Constitution makes a subtle distinction between women representatives and other categories of special representatives (for whom there are simply a few national seats, not district seats), such as youth, workers, and disabled people. Representatives of other special interest groups are elected directly by their national organizations, but women are elected through an electoral college composed of local government politicians from the district.

5 CONCLUSIONS

In this Challenge Paper we identify and elaborate four key policies that address fundamental disadvantages that women face and prevent them from having a life of their own choosing. These policy choices are informed by a framework of gender equality that is based on equality in rights, equality of opportunity, access to markets (e.g., labor, land, credit) and to

resources, and equality of voice. We review the scope of challenges regarding gender equality and the welfare of women, with a focus on developing countries. Since large gender disparities are present in so many different aspects of life, it is not easy to limit the options to such a small number of specific policies without appearing overly simplistic. It is not sufficiently helpful to recommend broad swaths of policy, such as to recommend an increase in women's employment and earnings, since there are a multitude of ways by which to achieve that, including a wide range of legislative reforms. Thus, while we include as our first option to increase and improve girls' schooling, a relatively general recommendation, in particular we lend our support to the use of a demand-side approach—specifically, cash transfers to households that are conditioned on girls attending school—that has proved effective in raising girls' enrollment rate and completed years of schooling. We also argue for targeting the policy to the poorest and disadvantaged girls because more standard approaches to raising enrollments are already in place for expanding enrollments in these countries. In education, the challenge is to identify a sharp enough policy instrument to address specific gaps in educational development.

From a long list of possible policy reforms in different sectors, we have chosen those that we believe would most increase women's agency, that is, women's ability and power to act on their choices in life, and those that correspond to the different roles that women are expected to play or do play the world over—mother, worker, and citizen. The option of (1) increasing and improving girls' schooling is an obvious choice, as indicated by the evidence on its importance and by the fact that it occurs early in a woman's life and therefore can provide benefits for many years. We also put forward the options of (2) expanding women's access to financial services in order to improve their access to household resources and to reduce their financial vulnerability, (3) supporting women's reproductive roles through services that ensure greater access to family planning programs, safer pregnancies, safer births, and safer abortions; and (4) strengthening women's voice in policy through greater political representation in local governments. Our selection is admittedly not based on a comparison of the benefit-cost ratios for a complete list of possible options, but it is based on our reading of the economic literature on gender issues and the conceptual framework summarized in the paper. We have discussed the evidence from previous studies that justifies the choice of these four options.

We summarize our main estimates in Table 15. Using the lower value of DALYs, the benefit-cost ratios range widely from 0.73 to 10.63 using a discount rate of 3 percent and from 0.60 to 10.50 using a discount rate of 6 percent. Using the higher value of DALYs yields benefit-cost ratios that range from 1.06 to 53.13 using the lower discount rate and from 0.92 to 52.5 using the higher discount rate. This table suggests that some forms of the microcredit option have the lowest benefit cost-ratio while forms of the option to support the reproductive role of women have the highest. In interpreting these ratios, it is important to keep in mind that they depend greatly on the availability of reliable and comparable data across countries; due to severe data scarcity, some of these estimates are based only on thin empirical evidence. With increased availability of data, the estimates will likely change; nonetheless, while the absolute values of the estimates may change, the relative ranking of these options may not.

[Table 15 about here]

We analyzed the benefit-cost ratios of the four policy options individually, and yet it is clear that they potentially interconnect. For example, better educated girls become mothers who would have fewer, healthier, more educated children, tend to engage in their own business activities and therefore have greater demand for access to loans and other financial services, and would be more likely to enter politics. Similarly, women who have greater access to financial services have more bargaining power within the household and would probably have greater demand for family planning services and better maternal and child care services. Because it is impossible to trace all the indirect benefits of each option, our estimates miss many of these important synergies. It follows that the policy options would be more potent if they are implemented together or at least at about the same time. Moreover, taking into account these synergies could result in a different ranking of the options.

Some caveats about our benefit-cost estimates:

We calculate benefits on the basis of parameter estimates of just a few empirical studies on developing countries and we apply those estimates generally in our calculations. For example, not many microcredit programs have been evaluated like the Grameen Bank in Bangladesh; similarly, few political representation reforms have been evaluated rigorously outside India. For this reason, we use the results of the studies of these programs to predict the benefits from a widespread application. While we consider low and high scenarios with respect to benefits if estimates range widely, we are clearly not able to capture the heterogeneity among the countries, much less within countries. Our estimates would have to be interpreted in this light, and they would have to be adjusted as more evidence becomes available from various settings. In addition, our estimates will also have to be adjusted even for Bangladesh or India because the long-run impact of the Grameen Bank or of mandated political representation might be significantly different from its short-run impact.

We find very few cost or benefit-cost estimates of programs, especially ones that are calculated alongside an assessment of their benefits. This makes the costing of the options difficult. It is hardly ever clear what items are included in the cost estimates and therefore how much of the cost is fixed or variable, whether existing infrastructure or personnel have been included or excluded from the cost of a program, and so on. Except for the option on reproductive services for women for which several program studies have estimated benefit-cost ratios, we have had to assemble pieces of information on program costs independently of the information sources on benefits. Programs are implemented with different levels of administrative efficiency which will affect program costs and/or benefits independently of other factors; this is one aspect of available cost numbers that we are not able to discern for lack of published information. Finally, as with benefits, we do also consider low and high cost scenarios when estimates range widely, but we are not able to address heterogeneity in costs across countries, much less within countries.

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Table 1. Women's Participation in the Informal Sector

	Percentage of non-agricultural labor force that is in the informal sector 1991/1997		Women's share of the informal sector in the non-agricultural labor force 1991/1997
	Women	Men	
Africa			
Benin	97	83	62
Chad	97	59	53
Guinea	84	61	37
Kenya	83	59	60
Mali	96	91	59
South Africa	30	14	61
Tunisia	39	52	18
Latin America			
Bolivia	74	55	51
Brazil	67	55	47
Chile	44	31	46
Colombia	44	42	50
Costa Rica	48	46	40
El Salvador	69	47	58
Honduras	65	51	56
Mexico	55	44	44
Panama	41	35	44
Venezuela	47	47	38
Asia			
India	91	70	23
Indonesia	88	69	43
Philippines	64	66	46
Thailand	54	49	47

Source: The World's Women 2000: Trends and Statistics,
 United Nations, Chart 5.13

Table 2. Fertility rates, teenage pregnancy and family planning

	Total fertility rate	Percentage who had children or is currently pregnant	Unmet need for family planning
Sub-Saharan Africa			
Benin 2001	5.6	21.5	27.2
Burkina Faso 2003	5.9	23.2	28.8
Cameroon 2004	5.0	28.4	20.2
Chad 2004	6.3	36.6	20.7
Congo (Brazzaville) 2005	4.8	27.3	16.2
Eritrea 2002	4.8	14.0	27.0
Ethiopia 2005	5.4	16.6	33.8
Ghana 2003	4.4	13.8	34.0
Guinea 2005	5.7	31.8	21.2
Kenya 2003	4.9	23.0	24.5
Lesotho 2004	3.5	20.2	31.0
Madagascar 2003/2004	5.2	34.0	23.6
Malawi 2004	6.0	34.1	27.6
Mali 2001	6.8	40.4	28.5
Mozambique 2003	5.5	41.0	18.4
Nigeria 2003	5.7	25.2	16.9
Rwanda 2005	6.1	4.1	37.9
Senegal 2005	5.3	18.9	31.6
Tanzania 2004	5.7	26.0	21.8
Zambia 2001/02	5.9	31.6	27.4
North Africa/West Asia/Europe			
Armenia 2005	1.7	4.7	13.3
Egypt 2005	3.1	9.4	10.3
Jordan 2002	3.7	4.3	11.0
Moldova Republic of 2005	1.7	6.1	6.7
Morocco 2003-2004 ⁽²⁾	2.5	6.5	10.0
South & Southeast Asia			
Bangladesh 2004 ⁽³⁾	3.0	32.7	11.2
Indonesia 2002/2003	2.6	10.4	8.6
Nepal 2001	4.1	21.4	27.8
Philippines 2003	3.5	8.0	17.3
Vietnam 2002	1.9	3.4	4.8
Latin America & Caribbean			
Bolivia 2003	3.8	15.7	22.7
Colombia 2005	2.4	20.5	5.8
Dominican Republic 2002	3.0	23.3	10.9
Honduras 2005	3.3	21.5	-
Nicaragua 2001	3.2	24.7	14.6

Source: ORC Macro, 2007. MEASURE DHS STATcompiler. <http://www.measuredhs.com>, September 11 2007.

Notes: (1) Total fertility rate and proportion of women pregnant: Total fertility rate for the three years preceding the survey and the percentage of women 15-49 currently pregnant, by selected background characteristics. (2) Teenage pregnancy and motherhood: Percentage of women 15-19 who are mothers or pregnant with their first child by selected background characteristics. (3) Unmet need for family planning services: Percentage of currently married women with unmet need for family planning, met need for family planning, and the total demand for family planning services.

Table 3. Causes of maternal mortality and morbidity (%)

	Mortality	Morbidity
Hemorrhage	28	18
Sepsis	15	16
Hypertensive disorders	14	9
Obstructed labor	8	9
Unsafe abortion	13	26
Other maternal	22	22
	100	100

Source: Graham et al. (2006)

Note: Nonobstetric (indirect) causes of death and morbidity, such as tuberculosis and malaria, have been excluded.

Table 4. Percent share of women in parliament, January 1997 and January 2007

	Single House or lower House		Upper House or Senate		Both Houses combined	
	1997	2007	1997	2007	1997	2007
Nordic countries	36.4	40.8	--	---	36.4	40.8
Americas	12.9	20.0	11.5	19.3	12.7	19.9
Sub-Saharan Africa	10.1	16.6	13.6	18.5	10.4	16.8
Asia	13.4	16.5	9.9	15.7	13.1	16.4
Pacific	9.8	12.4	21.8	31.8	11.6	14.5
Arab States	3.3	9.5	2.1	6.3	3.3	8.8
Total number of female ministers	3956	6462	556	1074	4512	7436
Total number of ministers	34839	37174	5914	6708	40753	43882

Source: <http://www.ipu.org/wmn-e/world.htm>

Table 5: Option 1--Assumptions used for estimating benefit-cost ratios

<i>Basic Assumptions</i>	
Initial Income at exchange rates (World Development Indicators)	\$450
Initial Female Schooling (Abu-Ghaida and Klasen, 2004)	3 years
Total Fertility Rate (World Development Indicators)	3
<i>Cost Assumptions</i>	
Costs of grants in relation to per-capita income (derived from Schultz, 2004)	6%
Additional administrative costs share (derived from IFPRI, 2004)	20%
Additional costs to ensure supply for increased demand	20%
Costs per student	\$32
Duration of grant receipt	7 years
Number of students supported per \$billion spent	4.4 million
<i>Benefit Assumptions</i>	
Increase in Schooling Attainment (Behrman, Parker, Todd, 2008)	1 year
Increase in Schooling Attainment (Schultz 2004)	0.7 year
Increase of Schooling Attainment of next generation	50% of initial effect
Increase in income (elasticity with respect to schooling years, Knowles, Lorgelly, and Owen, 2002)	0.37
Reduction in child mortality per year of schooling (Schultz, 1997)	13/1000
Reduction in child mortality per \$ of cash transfer for 50% of population and duration of program (Thomas 1990)	0.007/1000
Increase in DALYs for every death under 5 avoided	47

Table 6: Option 1--Estimates of Benefits and Benefit-Cost Ratios for Conditional Cash Transfer (CCT) Program to Promote Female Education per \$billion spent

	<u>Low Discount Rate</u>		<u>High Discount Rate</u>	
	DALY (low value)	DALY (high value)	DALY (low value)	DALY (high value)
<i>Assuming CCT Program will achieve 1 more year of female schooling ('000 \$)</i>				
Income Benefit	5786163	5786163	2936553	2936553
Mortality Benefit	4065952	20329760	2054106	10270533
Total Benefit	9852115	26115923	4990659	13207086
Benefit/Cost Ratio	9.85	26.12	4.99	13.21
<i>Assuming CCT Program will achieve 0.7 more years of schooling ('000\$)</i>				
Income Benefit	4050314	4050314	2055587	2055587
Mortality Benefit	2846166	14230832	1437874	7189373
Total Benefit	6896480	18281146	3493462	9244960
Benefit/Cost Ratio	6.90	18.28	3.49	9.24
<i>Assuming 1 more year of schooling, additional supply costs and direct mortality benefit of cash transfer</i>				
Income Benefit	4959568	4959568	2517045	2517045
Mortality Benefit	3491540	17457701	1437874	8832998
Total Benefit	8451108	22417269	3493462	1135044
Benefit/Cost Ratio	8.45	22.42	3.49	11.35

Table 7: Option 2: Assumptions used for estimating benefit-cost ratios

Annual growth in number of new poor women borrowers (Khandker et al. 1995, Table 3.4)	35%
Number of new borrowers in initial year of program (Khandker et al. 1995, Table 3.4)	348,000
Average loan per new borrower (Cull, Demirgüç-Kunt and Morduch 2007)	285
<i>Benefits</i>	
First year return to credit for household (increase in consumption) (Khandker 2005)	9.45%
Average annual increase in household expenditure from old loans (Khandker 2005)	0.98%
Number of years borrower accrues increased expenditure from old loans in lifetime	30
Elasticity of intergenerational transmission of income and health	0.50%
Number of generations whose expenditures increase due to old credit (not including self)	2
Number of generations of children whose health is improved (including own children)	4
Increase in DALYs, Lower Bound:	
Increase in DALYs per \$ loaned to women (first year of loan) (Duflo 2000)	0.000030
Increase in DALYs per \$ loaned to women (2nd & 3rd years after loan) (Duflo 2000)	0.000003
Increase in DALYs, Upper Bound (Pitt et al. 2003)	0.000686
<i>Costs</i>	
Cost for Grameen Bank (1991/92) (Khandker 1998)	0.172
Cost for BRAC (1991/92) (Khandker 1998)	0.444
Weighted average of above two costs based on loans disbursed (Khandker 1998)	0.204

Table 8: Option 2: Estimates of benefits and costs for microfinance (million \$US)

	Low discount rate		High discount rate	
	DALY			
	(Low value)	(High value)	(Low value)	(High value)
<i>Assuming the lower bound increase in DALY's from microcredit</i>				
Income benefit	1,296	1,296	862	862
Mortality benefit	165	825	136	680
Total benefits	1,461	2,121	998	1,543
Total Costs				
Constant average costs scenario	922	922	767	767
Constant high costs scenario	2,007	2,007	1,669	1,669
Constant low costs scenario	778	778	647	647
Declining costs scenario	817	817	682	682
Benefit/cost ratio				
Constant average costs scenario	1.59	2.30	1.30	2.01
Constant high costs scenario	0.73	1.06	0.60	0.92
Constant low costs scenario	1.88	2.73	1.54	2.39
Declining costs scenario	1.79	2.59	1.46	2.26
<i>Assuming the upper bound increase in DALY's from microcredit</i>				
Income benefit	1,296	1,296	862	862
Mortality benefit	3,105	15,526	2,579	12,896
Total benefits	4,401	16,822	3,441	13,758
Total Costs				
Constant average costs scenario	922	922	767	767
Constant high costs scenario	2,007	2,007	1,669	1,669
Constant low costs scenario	778	778	647	647
Declining costs scenario	817	817	682	682
Benefit/cost ratio				
Constant average costs scenario	4.78	18.25	4.49	17.95
Constant high costs scenario	2.19	8.38	2.06	8.24
Constant low costs scenario	5.66	21.64	5.32	21.28
Declining costs scenario	5.38	20.58	5.05	20.17

Table 9: Option 3: Assumptions used for estimating benefit-cost ratios

	South Asia	Sub-Saharan Africa
<i>Benefits</i>		
DALYs lost due to unwanted fertility and unsafe abortions in year 0 (Levine et al. 2006, Table 57.2)	1,669,727	1,821,721
Number of women with an unmet need for contraception (Levine et al. 2006)	89,375,000	66,445,000
Number of years to eliminate unwanted fertility and unsafe abortions*	14	43
Number of DALYs gained per million population** from maternal health programs (Graham et al. 2006):		
Routine maternity care	3,273	6,969
Increased primary-level coverage	4,582	9,757
Improved overall quality of care with nutritional supplements	6,225	13,753
Improved overall quality of care without nutritional supplements	4,727	12,770
Improved quality of CEmOC	3,320	7,069
Improved overall quality of care and coverage with nutritional supplements	9,354	20,664
Improved overall quality of care and coverage without nutritional supplements	7,103	19,188
<i>Costs</i>		
Cost of promotional campaign for family planning		
Low Estimate	1.30	1.30
High Estimate	3.50	3.50
Average cost of family planning program per DALY gained (2001 U.S. dollars) (Levine et al. 2006)	30	34
Cost of maternal health programs per DALY saved per million population (million U.S. dollars) (Graham et al. 2006):		
Routine maternity care	125	86
Increased primary-level coverage	148	92
Improved overall quality of care with nutritional supplements	142	83
Improved overall quality of care without nutritional supplements	240	77
Improved quality of CEmOC	255	151
Improved overall quality of care and coverage with nutritional supplements	144	86
Improved overall quality of care and coverage without nutritional supplements	203	84

* This is based on a total percent decline in the fertility rate in developing countries over the past 50 years of 53% (from 6 to 2.8 children per woman), implying an annual decline in the fertility rate of roughly 1.07%. Taking the fertility rates in South Asia and sub-Saharan Africa of 3.3 and 5.2 respectively, if these rates were to decline annually by 1.07%, it would take around 14 years to do so in South Asia and 43 years in sub-Saharan Africa.

** Total population in 2001 (millions) for South Asia and sub-Saharan Africa respectively are 1,375 and 685 (WDI Indicators).

Table 10: Option 3: Estimates of benefits and costs for support for women's reproductive role
(million US\$)

	Low discount rate		High discount rate	
	(Low value)	(High value)	(Low value)	(High value)
	DALY			
Total benefits to family planning	38,982	194,911	30,802	154,010
Benefits to maternal care				
Routine maternity care	174,595	872,973	124,173	620,866
Increased primary-level coverage	244,436	1,222,180	173,844	869,220
Improved overall quality of care with nutritional supplements	340,596	1,702,982	241,736	1,208,680
Improved overall quality of care w/o nutritional supplements	298,448	1,492,239	209,551	1,047,755
Improved quality of CEmOC	177,101	885,503	125,955	629,777
Improved overall quality of care & coverage with supplements	511,764	2,558,819	363,223	1,816,114
Improved overall quality of care & coverage w/o supplements	448,448	2,242,239	314,872	1,574,360
Total Benefits				
Routine maternity care	213,577	1,067,884	154,975	774,875
Increased primary-level coverage	283,418	1,417,091	204,646	1,023,230
Improved overall quality of care with nutritional supplements	379,578	1,897,892	272,538	1,362,689
Improved overall quality of care w/o nutritional supplements	337,430	1,687,150	240,353	1,201,765
Improved quality of CEmOC	216,083	1,080,414	156,757	783,787
Improved overall quality of care & coverage with supplements	550,746	2,753,730	394,025	1,970,124
Improved overall quality of care & coverage w/o supplements	487,430	2,437,149	345,674	1,728,370
Cost of promotional campaign for family planning				
Low estimate	956	956	717	717
High estimate	11	11	10	10
Cost of implementing family planning program	2,872	2,872	2,238	2,238
Costs of maternal care				
Routine maternity care	17,227	17,227	12,521	12,521
Increased primary-level coverage	26,826	26,826	19,626	19,626
Improved overall quality of care with nutritional supplements	34,479	34,479	25,263	25,263
Improved overall quality of care w/o nutritional supplements	36,007	36,007	27,042	27,042
Improved quality of CEmOC	37,447	37,447	27,982	27,982
Improved overall quality of care & coverage with supplements	49,592	49,592	35,909	35,909
Improved overall quality of care & coverage w/o supplements	51,960	51,960	38,414	38,414
Total Costs (including low promotional campaign costs)				
Routine maternity care	20,100	20,100	14,759	14,759
Increased primary-level coverage	29,699	29,699	21,864	21,864
Improved overall quality of care with nutritional supplements	37,351	37,351	27,501	27,501
Improved overall quality of care w/o nutritional supplements	38,880	38,880	29,281	29,281
Improved quality of CEmOC	40,319	40,319	30,220	30,220
Improved overall quality of care & coverage with supplements	52,464	52,464	38,147	38,147
Improved overall quality of care & coverage w/o supplements	54,833	54,833	40,653	40,653
Total Costs (including high promotional campaign costs)				
Routine maternity care	22,328	22,328	16,427	16,427
Increased primary-level coverage	31,927	31,927	23,532	23,532

Improved overall quality of care with nutritional supplements	39,580	39,580	29,169	29,169
Improved overall quality of care w/o nutritional supplements	41,108	41,108	30,948	30,948
Improved quality of CEmOC	42,548	42,548	31,888	31,888
Improved overall quality of care & coverage with supplements	54,693	54,693	39,815	39,815
Improved overall quality of care & coverage w/o supplements	57,061	57,061	42,320	42,320
Benefit/cost ratio (including low promotional campaign costs)				
Routine maternity care	10.63	53.13	10.50	52.50
Increased primary-level coverage	9.54	47.72	9.36	46.80
Improved overall quality of care with nutritional supplements	10.16	50.81	9.91	49.55
Improved overall quality of care w/o nutritional supplements	8.68	43.39	8.21	41.04
Improved quality of CEmOC	5.36	26.80	5.19	25.94
Improved overall quality of care & coverage with supplements	10.50	52.49	10.33	51.65
Improved overall quality of care & coverage w/o supplements	8.89	44.45	8.50	42.52
Benefit/cost ratio (including high promotional campaign costs)				
Routine maternity care	9.57	47.83	9.43	47.17
Increased primary-level coverage	8.88	44.38	8.70	43.48
Improved overall quality of care with nutritional supplements	9.59	47.95	9.34	46.72
Improved overall quality of care w/o nutritional supplements	8.21	41.04	7.77	38.83
Improved quality of CEmOC	5.08	25.39	4.92	24.58
Improved overall quality of care & coverage with supplements	10.07	50.35	9.90	49.48
Improved overall quality of care & coverage w/o supplements	8.54	42.71	8.17	40.84

Table 11. Participation rate of men and women in organizations (in percent)

	Rural men		Rural women	
	N=9,885		N=9,917	
	<i>Active member</i>	<i>Official leader</i>	<i>Active member</i>	<i>Official leader</i>
Religious group	41.82	5.95	41.67	5.58
Trade union or farmers' association	11.47	1.75	10.44	1.97
Professional or business association	6.76	1.05	7.6	1.29
Community development or self-help association	14.32	2.75	13.39	2.51

Source of data: Afrobarometer (2005), Sub-Saharan Africa, Round 3 data

Table 12. Mass media exposure

	Men	Women
No mass media exposure	15.0	24.5
Reads newspaper weekly	32.1	27.9
Watches television weekly	42.6	49.9
Listens to radio weekly	69.2	55.5
All three media	20.3	18.6

Data source: DHS, latest year; population-weighted shares

Table 13. Option 4: Assumptions used for estimates of benefit-cost ratios

% share of women politicians (based on mean % share in parliament, 2005)	12.83
% annual growth in share of women politicians	
High scenario: 20 years to reach 30% share, 30 years to reach 50%	0.045
Low scenario: 30 years to reach 30% share, 45 years to reach 50%	0.03
<i>Benefits</i>	
Immunization rates, 2005 (mean; but used population-weighted, region-specific rates)	69.32015289
Total DALYs gained per % increase in immunization (DCPP, 2006)	10485395
Estimated impact of political reservation on immunization rates (Beaman et al. 2006)	+2 percentage points
% population with access to safe water supply, 2004	
DALYs gained per 1% increase in safe water supply (Cairncross & Valdmanis 2006)	
Low scenario	43,992
High scenario	51,358
Estimated impact of political reservation on water supply (Beaman et al. 2006)	
Estimated impact of political reservation on road quality (Beaman et al. 2006)	0.21% better
Estimated impact of better roads on primary schooling completion (Mu & van de Walle 2007)	+10 percentage points
Average primary school completion rate (World Bank 2007), range of 58-98%	84%
Wage premia for completed primary education (Pritchett), 1.97-2.44	2%
<i>Costs</i>	
Adult population in less developed countries, 15-64 (2005) (http://esa.un.org/unpp/index.asp?)	
% population, ages 25-59	40%
% population female	49%
% population rural (mean; but used region-specific rate) (http://esa.un.org/unpp/index.asp?)	57.1
Average % women who are official leaders in organizations (e.g., community development) (Afrobarometer data, 2005)	2.62%-5.6%
Average (per person) annual cost of public information campaign, \$US 2007	
Low (for high-density or urban populations)	1
High (for low-density or rural populations)	1.5
Average annual cost per trainee in management/leadership course	
Same as basic education expenditure	27

Table 14. Option 4: Estimates of benefits and costs for political affirmative action

	Low discount rate		High discount rate	
	DALY (Low value)	DALY (High value)	DALY (Low value)	DALY (High value)
<i>Assuming women's share in local government takes 20 years to reach 30% and 30 years to reach 50%</i>				
Income benefit	13092042	13092042	7157200	7157200
Mortality benefit	79028735	477823691	41157806	248948077
Total benefits	92120777	490915734	48315005	256105276
Total costs				
Low cost scenario	27686210	27686210	19095849	19095849
High cost scenario	34908690	34908690	21226741	21226741
Benefit/cost ratio				
Low cost scenario	3.33	17.73	2.53	13.41
High cost scenario	2.64	14.06	2.28	12.07
<i>Assuming women's share in local government takes 30 years to reach 30% and 45 years to reach 50%</i>				
Income benefit	13092042	13092042	7157200	7157200
Mortality benefit	55406842	319568790	28950683	167022327
Total benefits	68498884	332660832	36107882	174179526
Total costs				
Low cost scenario	27686210	27686210	19095849	19095849
High cost scenario	34908690	34908690	21226741	21226741
Benefit/cost ratio				
Low cost scenario	2.47	12.02	1.89	9.12
High cost scenario	1.96	9.53	1.70	8.21

Table 15. Summary of benefit-cost ratios for four options and selected scenarios

Option	Alternative scenarios	Low discount rate		High discount rate		
		DALY (Low value)	DALY (High value)	DALY (Low value)	DALY (High value)	
1a	High return scenario	9.85	26.12	4.99	13.21	
1b	Low return scenario	6.90	18.28	3.49	9.24	
2a	Constant average costs scenario	1.59	2.30	1.30	2.01	
	Constant high costs scenario	0.73	1.06	0.60	0.92	
	Constant low costs scenario	1.88	2.73	1.54	2.39	
	Declining costs scenario	1.79	2.59	1.46	2.26	
2b	Constant average costs scenario	4.78	18.25	4.49	17.95	
	Constant high costs scenario	2.19	8.38	2.06	8.24	
	Constant low costs scenario	5.66	21.64	5.32	21.28	
	Declining costs scenario	5.38	20.58	5.05	20.17	
3a	Low promotional cost campaign					
	FP + Routine maternity care	10.63	53.13	10.50	52.50	
	FP + Increased primary-level coverage	9.54	47.72	9.36	46.80	
	FP + Improved overall quality of care + nutritional supplements	10.16	50.81	9.91	49.55	
	FP + Improved overall quality of care	8.68	43.39	8.21	41.04	
	FP + Improved quality of CEmOC	5.36	26.80	5.19	25.94	
	FP + Improved overall quality of care & coverage + nutritional supplements	10.50	52.49	10.33	51.65	
	FP + Improved overall quality of care & coverage	8.89	44.45	8.50	42.52	
	3b	High promotional cost campaign				
		FP + Routine maternity care	9.57	47.83	9.43	47.17
FP + Increased primary-level coverage		8.88	44.38	8.70	43.48	
FP + Improved overall quality of care + nutritional supplements		9.59	47.95	9.34	46.72	
FP + Improved overall quality of care		8.21	41.04	7.77	38.83	
FP + Improved quality of CEmOC		5.08	25.39	4.92	24.58	
FP + Improved overall quality of care & coverage + nutritional supplements		10.07	50.35	9.90	49.48	
FP + Improved overall quality of care & coverage		8.54	42.71	8.17	40.84	
4a		Low cost scenario	3.33	17.73	2.53	13.41
		High cost scenario	2.64	14.06	2.28	12.07
4b	Low cost scenario	2.47	12.02	1.89	9.12	
	High cost scenario	1.96	9.53	1.70	8.21	

Notes: These are extracted from tables 6, 8, 10, 14.

Figure 1. Gender and Urban-Rural Differences in Years of Schooling, Selected Countries

Source of data: Demographic and Health Surveys, latest years

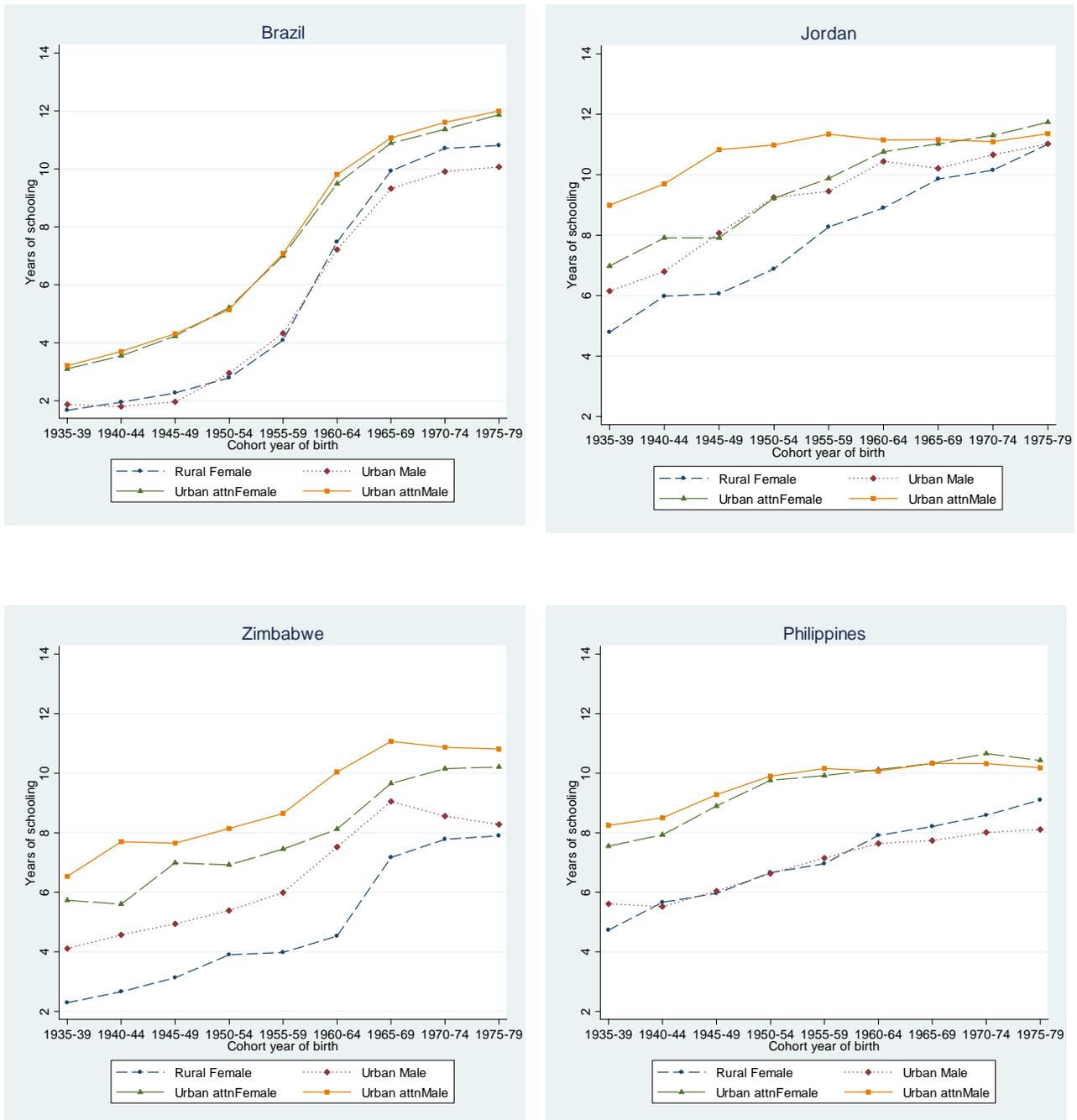
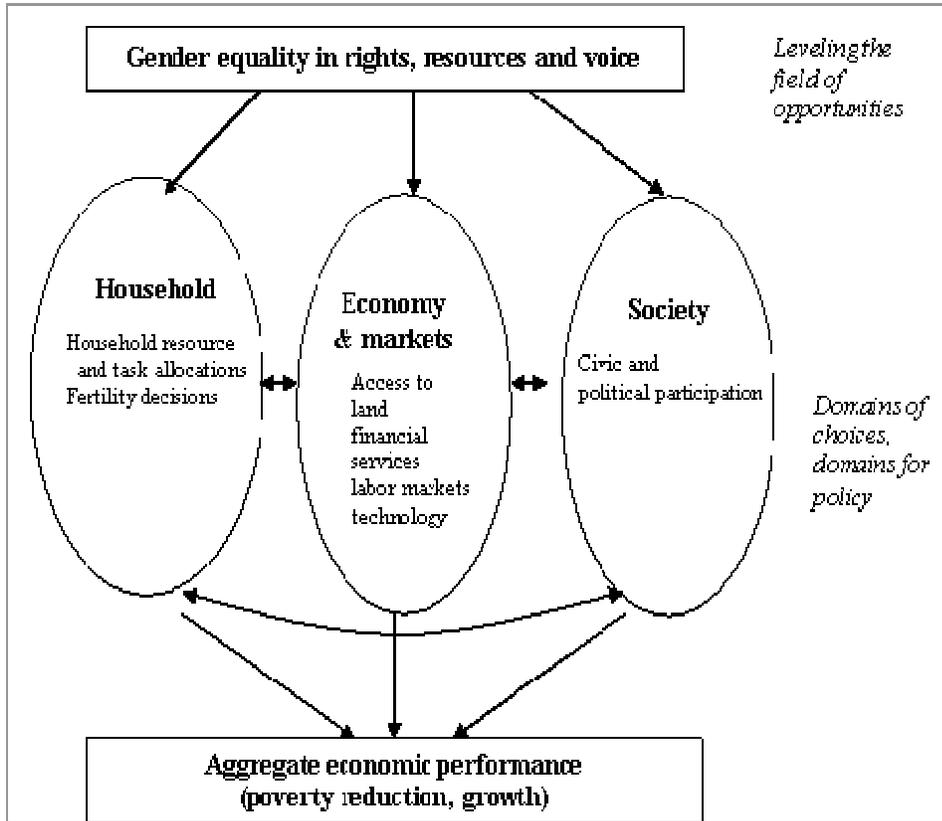


Figure 2. Framework for approaches to promoting gender equality



Source: World Bank (2007). *Global Monitoring Report 2007*.

Figure 3. Option 2—Flowchart of benefits from microfinance program

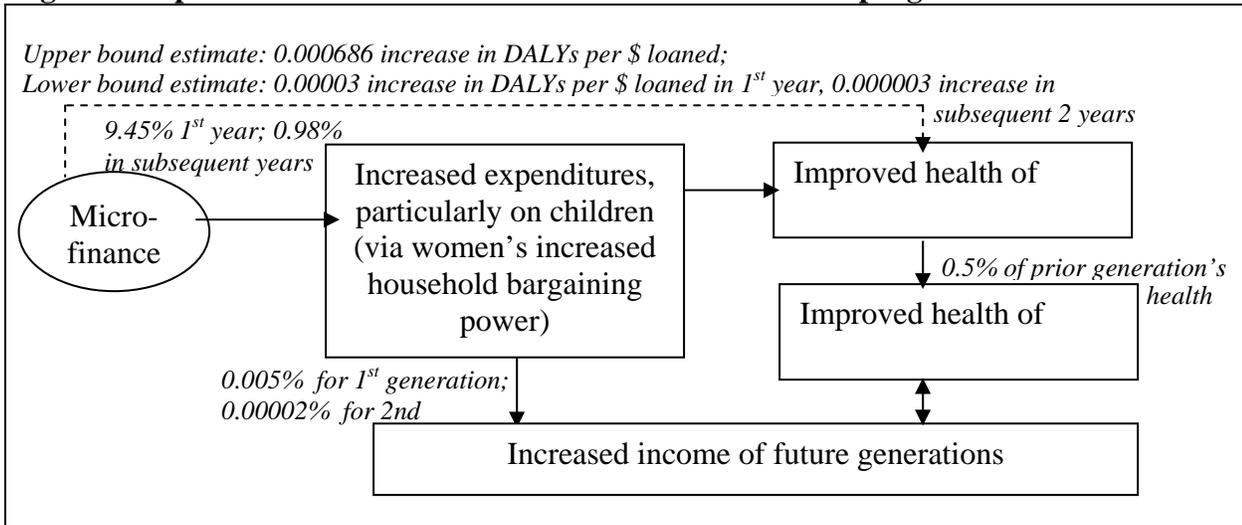


Figure 4. Option 3—Flowchart of benefits from improved women’s reproductive choices

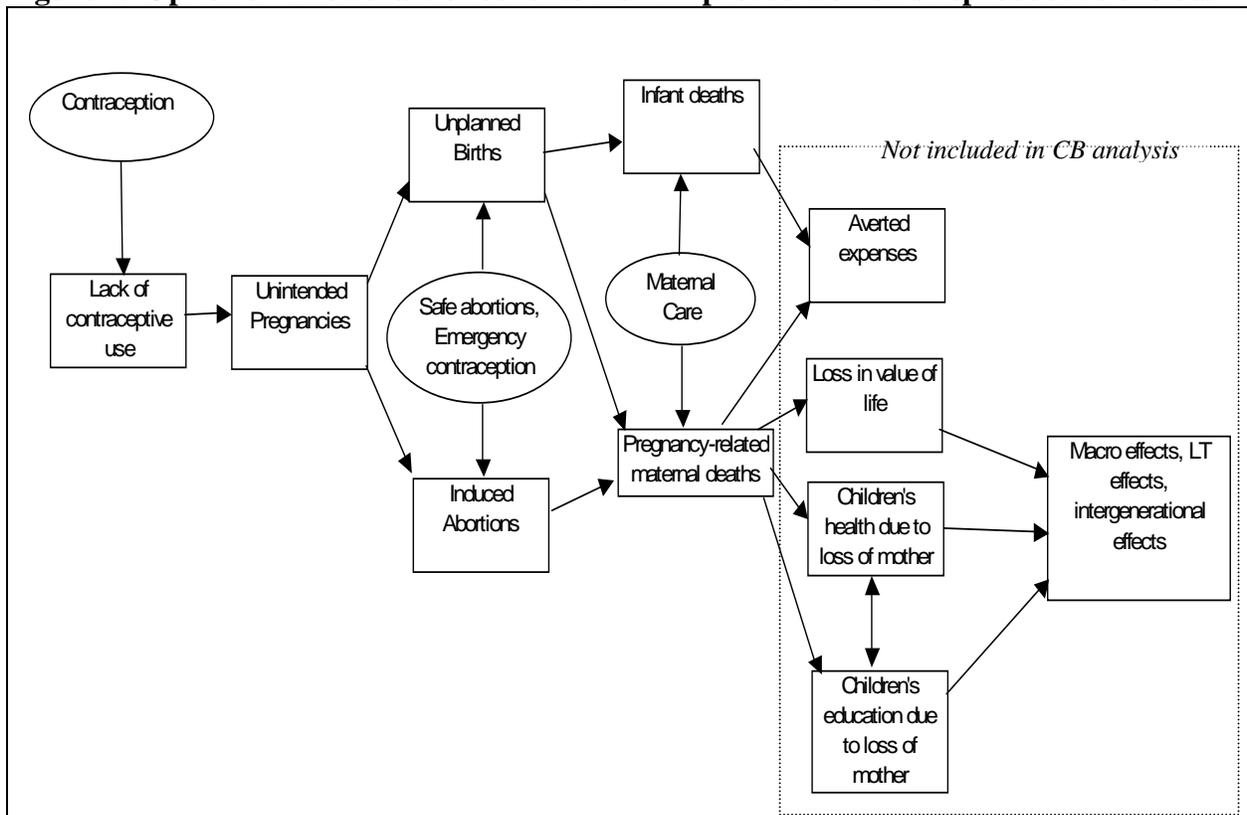
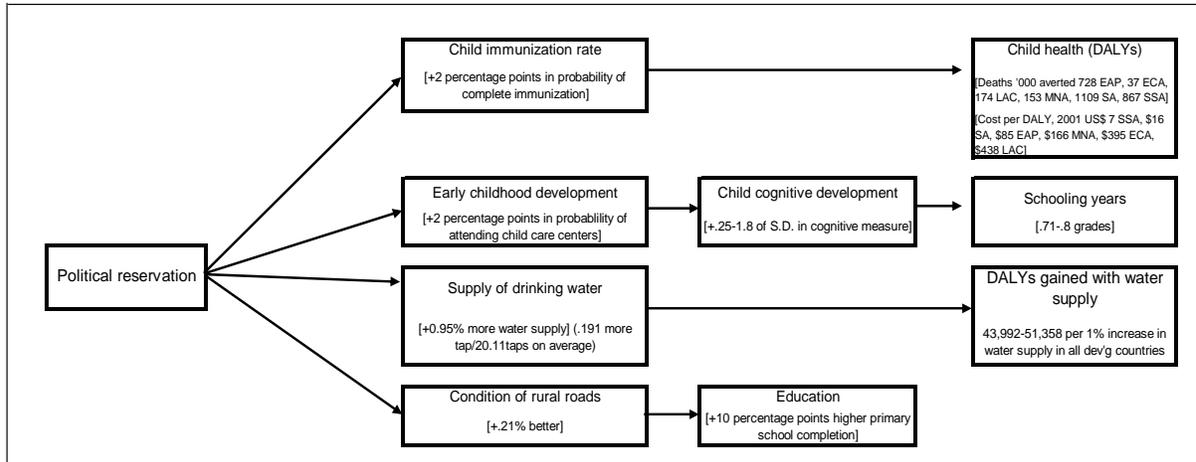


Figure 5. Option 4--Pathways of benefits of greater political participation of women



References:
 Brenzel et al. (2006)
 Cairncross & Valdmanis (2006)
 Chattopadhyay and Duflo 2004
 Mu and van de Walle (2007)

Appendix Table 1: Option 2: Calculation of DALYs averted per dollar loaned to women (Upper Bound)

	Girls	Boys	Source
Women's credit elasticity of children's height-for-age (cm per age-year)			
(1) % increase in cm per age-year needed to move child out of malnourishment (at average age in Pitt et al. (2003)	1.14	1.53	Pitt et al. 2003 Est. from WHO Child Growth Standards http://www.who.int/childgrowth/standards/
(2) sample	11.97	11.45	
(3) % increase in credit needed to move child out of malnourishment	10.50	7.48	(2) / (1)
Average amount women borrowed			
(4) (taka)	9,675.95	9,675.95	Pitt et al. 2003 World Development Indicators Database
1991-92 average exchange rate			
(5) (taka/dollar)	38.00	38.00	
Average amount women borrowed			
(6) (U.S. dollars)	254.63	254.63	(4) / (5)
\$ needed (in loans) to save one child from malnourishment (on average)	2,927.41	2,160.13	(6) x [1 + (3)] Caulfield et al. 2006 Table 28.4
Average DALYs saved per			
(8) undernourished child averted	2.13	2.13	
\$ needed in loans to women to avert one DALY due to undernourishment	1,374.26	1,014.06	(7) / (8)
DALYs averted per \$ loaned to women	0.000728	0.000986	1 / (9)

Appendix Table 2: Option 2: Calculation of DALYs averted per dollar loaned to women (Lower Bound)

	1st year of loan	2nd & 3rd years after loan	Source
Increase in height-for-age z-score per dollar increase in income to women (standard deviations)			
(1) % increase in household expenditure per dollar loaned to women	0.000226	0.000226	Duflo
(2) Increase in height-for-age z-score per dollar loaned to women	9.450000	0.980000	Khandker (2005)
(3) Increase in z-score needed to move child out of malnourishment	0.000021	0.000002	(2) / 100 x (1)
(4) \$ needed (in loans) to save one child from malnourishment (on average)	1.500000	1.500000	WHO
Average DALYs saved per			
(5) undernourished child averted	70,084.49	675,814.68	(4) / (3) Caulfield et al. 2006 Table 28.4
\$ needed in loans to women to avert one DALY due to undernourishment	2.13	2.13	
(6) DALYs averted per \$ loaned to women	32,900.90	317,258.66	(5) / (6)
(8) women	0.000030	0.000003	1 / (7)

Appendix Table 3: Option 3: Estimates of benefits and costs for support for women's reproductive role (million US\$)

	Low discount rate		High discount rate	
	DALY			
	(Low value)	(High value)	(Low value)	(High value)
Total Benefits to family planning	38,982	194,911	30,802	154,010
South Asia	11,208	56,041	10,018	50,092
Sub-Saharan Africa	27,774	138,869	20,784	103,918
Benefits to maternal care				
Routine maternity care	174,595	872,973	124,173	620,866
South Asia	55,337	276,685	46,331	231,656
Sub-Saharan Africa	119,258	596,289	77,842	389,209
Increased primary-level coverage	244,436	1,222,180	173,844	869,220
South Asia	77,468	387,342	64,861	324,305
Sub-Saharan Africa	166,968	834,838	108,983	544,915
Improved overall quality of care with nutritional supplements	340,596	1,702,982	241,736	1,208,680
South Asia	105,247	526,234	88,119	440,593
Sub-Saharan Africa	235,350	1,176,748	153,617	768,086
Improved overall quality of care without nutritional supplements	298,448	1,492,239	209,551	1,047,755
South Asia	79,920	399,599	66,914	334,568
Sub-Saharan Africa	218,528	1,092,640	142,637	713,187
Improved quality of CEmOC	177,101	885,503	125,955	629,777
South Asia	56,132	280,658	46,997	234,983
Sub-Saharan Africa	120,969	604,845	78,959	394,794
Improved overall quality of care & coverage with supplements	511,764	2,558,819	363,223	1,816,114
South Asia	158,149	790,745	132,412	662,058
Sub-Saharan Africa	353,615	1,768,074	230,811	1,154,056
Improved overall quality of care & coverage without supplements	448,448	2,242,239	314,872	1,574,360
South Asia	120,091	600,456	100,547	502,736
Sub-Saharan Africa	328,357	1,641,783	214,325	1,071,624
Total Benefits				
Routine maternity care	213,577	1,067,884	154,975	774,875
Increased primary-level coverage	283,418	1,417,091	204,646	1,023,230
Improved overall quality of care with nutritional supplements	379,578	1,897,892	272,538	1,362,689
Improved overall quality of care without nutritional supplements	337,430	1,687,150	240,353	1,201,765
Improved quality of CEmOC	216,083	1,080,414	156,757	783,787
Improved overall quality of care & coverage with nutritional supplements	550,746	2,753,730	394,025	1,970,124
Improved overall quality of care & coverage without supplements	487,430	2,437,149	345,674	1,728,370
Cost of implementing family planning program	956	956	717	717
South Asia	11	11	10	10
Sub-Saharan Africa	944	944	707	707
Low cost of promotional campaign	1,917	1,917	1,522	1,522
South Asia	600	600	536	536
Sub-Saharan Africa	1,317	1,317	985	985
Total cost of family planning program (Low cost)	2,872	2,872	2,238	2,238

South Asia	611	611	546	546
Sub-Saharan Africa	2,261	2,261	1,692	1,692
High cost of promotional campaign	4,146	4,146	3,189	3,189
South Asia	600	600	536	536
Sub-Saharan Africa	3,546	3,546	2,653	2,653
Total cost of family planning program (High cost)	5,101	5,101	3,906	3,906
South Asia	611	611	546	546
Sub-Saharan Africa	4,490	4,490	3,360	3,360
Costs of maternal care				
Routine maternity care	17,227	17,227	12,521	12,521
South Asia	6,915	6,915	5,789	5,789
Sub-Saharan Africa	10,313	10,313	6,731	6,731
Increased primary-level coverage	26,826	26,826	19,626	19,626
South Asia	11,465	11,465	9,599	9,599
Sub-Saharan Africa	15,361	15,361	10,026	10,026
Improved overall quality of care with nutritional supplements	34,479	34,479	25,263	25,263
South Asia	14,945	14,945	12,513	12,513
Sub-Saharan Africa	19,534	19,534	12,750	12,750
Improved overall quality of care without nutritional supplements	36,007	36,007	27,042	27,042
South Asia	19,181	19,181	16,059	16,059
Sub-Saharan Africa	16,827	16,827	10,983	10,983
Improved quality of CEmOC	37,447	37,447	27,982	27,982
South Asia	19,181	19,181	16,059	16,059
Sub-Saharan Africa	18,266	18,266	11,923	11,923
Improved overall quality of care and coverage with supplements	49,592	49,592	35,909	35,909
South Asia	19,181	19,181	16,059	16,059
Sub-Saharan Africa	30,411	30,411	19,850	19,850
Improved overall quality of care and coverage without supplements	51,960	51,960	38,414	38,414
South Asia	24,379	24,379	20,411	20,411
Sub-Saharan Africa	27,582	27,582	18,003	18,003
Total Costs (including low promotional campaign costs)				
Routine maternity care	20,100	20,100	14,759	14,759
Increased primary-level coverage	29,699	29,699	21,864	21,864
Improved overall quality of care with nutritional supplements	37,351	37,351	27,501	27,501
Improved overall quality of care without nutritional supplements	38,880	38,880	29,281	29,281
Improved quality of CEmOC	40,319	40,319	30,220	30,220
Improved overall quality of care and coverage with supplements	52,464	52,464	38,147	38,147
Improved overall quality of care and coverage without supplements	54,833	54,833	40,653	40,653
Total Costs (including high promotional campaign costs)				
Routine maternity care	22,328	22,328	16,427	16,427
Increased primary-level coverage	31,927	31,927	23,532	23,532
Improved overall quality of care with nutritional supplements	39,580	39,580	29,169	29,169
Improved overall quality of care without nutritional supplements	41,108	41,108	30,948	30,948
Improved quality of CEmOC	42,548	42,548	31,888	31,888
Improved overall quality of care & coverage with supplements	54,693	54,693	39,815	39,815
Improved overall quality of care & coverage without supplements	57,061	57,061	42,320	42,320
Benefit/cost ratio (including low cost promotional campaign)				
Routine maternity care	10.63	53.13	10.50	52.50

Increased primary-level coverage	9.54	47.72	9.36	46.80
Improved overall quality of care with nutritional supplements	10.16	50.81	9.91	49.55
Improved overall quality of care without nutritional supplements	8.68	43.39	8.21	41.04
Improved quality of CEmOC	5.36	26.80	5.19	25.94
Improved overall quality of care & coverage with supplements	10.50	52.49	10.33	51.65
Improved overall quality of care & coverage without supplements	8.89	44.45	8.50	42.52
Benefit/cost ratio (including high cost promotional campaign)				
Routine maternity care	9.57	47.83	9.43	47.17
Increased primary-level coverage	8.88	44.38	8.70	43.48
Improved overall quality of care with nutritional supplements	9.59	47.95	9.34	46.72
Improved overall quality of care without nutritional supplements	8.21	41.04	7.77	38.83
Improved quality of CEmOC	5.08	25.39	4.92	24.58
Improved overall quality of care & coverage with supplements	10.07	50.35	9.90	49.48
Improved overall quality of care & coverage without supplements	8.54	42.71	8.17	40.84

**Appendix Table: Sensitivity Analysis Results, South Asia and Sub-Saharan Africa
(incremental cost per DALY averted, US\$)***

Option number	Alternative compared with base package	Best estimate	Effectiveness assumption		Inpatient cost assumption	
			High	Low	High	Low
<i>South Asia</i>						
2	Increased primary-level coverage	148	113	163	213	109
3a	Improved overall quality of care with nutritional supplements	142	100	163	142	143
3b	Improved overall quality of care without nutritional supplements	240	180	326	240	240
4	Improved quality of CEmOC	255	193	311	446	204
5a	Improved overall quality of care and coverage with nutritional supplements	144	104	164	152	136
5b	Improved overall quality of care and coverage without nutritional supplements	203	153	250	227	189
<i>Sub-Saharan Africa</i>						
2	Increased primary-level coverage	92	70	104	191	84
3a	Improved overall quality of care with nutritional supplements	83	64	90	83	83
3b	Improved overall quality of care without nutritional supplements	77	61	85	77	77
4	Improved quality of CEmOC	151	114	166	326	130
5a	Improved overall quality of care and coverage with nutritional supplements	86	66	94	123	82
5b	Improved overall quality of care and coverage without nutritional supplements	84	66	93	123	79

* Table 26.9 in Graham et al. (2006)

Appendix Table**Costs Per Inpatient Bed Day, South Asia and Sub-Saharan Africa (U.S. dollars)***

Cost of inpatient bed day	South Asia		Sub-Saharan Africa	
	Primary level	Secondary level	Primary level	Secondary level
Best estimate	6.51	8.5	6.17	8.05
Low	2.64	3.45	1.92	2.51
High	14.52	18.94	41.79	54.52

* Table 26.A1 in Graham et al. (2006)

Appendix Table**Assumed Effectiveness of Interventions (percentage of DALYs, deaths, and years of life lost averted)***

Condition	Best estimate	Low	High
<i>Maternal</i>			
Hemorrhage		85	80 90
Sepsis		75	70 90
Hypertensive disorders of pregnancy (including eclampsia)		76	71 95
Obstructed labor		80	75 95
Unsafe abortion		75	70 90
<i>Perinatal</i>			
Low birthweight			
In context without nutritional supplements ^a	8	3	14
In context with nutritional supplements ^a	28	23	44
Birth asphyxia (including birth trauma)			
In context without enhanced delivery care package ^a	40	35	60
In context with enhanced delivery care package ^a	70	65	90
Infections, including tetanus	60	55	80
Sepsis (newborn)	40	35	60
HIV/AIDS	60	55	80

*Table 26.A2 in Graham et al. (2006)

Appendix Table: Option 3: Sensitivity Analysis
Estimates of benefits and costs for support for
women's reproductive role (million US\$)

	Low discount rate		High discount rate	
	DALY			
	(Low value)	(High value)	(Low value)	(High value)
Benefit/cost ratio (Original estimates)				
Routine maternity care	11.75	58.73	11.71	58.54
Increased primary-level coverage	10.20	51.01	10.06	50.30
Improved overall quality of care with nutritional supplements	10.71	53.56	10.49	52.45
Improved overall quality of care without nutritional supplements	9.13	45.64	8.66	43.29
Improved quality of CEmOC	6.44	32.22	6.37	31.83
Improved overall quality of care and coverage with nutritional supplements	10.17	50.86	9.94	49.71
Improved overall quality of care and coverage without nutritional supplements	9.21	46.06	8.83	44.17
Benefit/cost ratio (Exponential growth in TFR assumed)*				
Routine maternity care	11.93	59.66	11.87	59.34
Increased primary-level coverage	10.43	52.14	10.26	51.30
Improved overall quality of care with nutritional supplements	10.98	54.92	10.73	53.66
Improved overall quality of care without nutritional supplements	9.63	48.17	9.09	45.46
Improved quality of CEmOC	6.61	33.05	6.51	32.56
Improved overall quality of care and coverage with nutritional supplements	10.42	52.12	10.17	50.84
Improved overall quality of care and coverage without nutritional supplements	9.60	47.99	9.18	45.88
Benefit/cost ratio (High effectiveness of interventions assumed)				
Routine maternity care	11.75	58.73	11.71	58.54
Increased primary-level coverage	13.25	66.23	13.06	65.28
Improved overall quality of care with nutritional supplements	14.30	71.50	14.08	70.39
Improved overall quality of care without nutritional supplements	11.77	58.84	11.20	56.00
Improved quality of CEmOC	8.45	42.24	8.34	41.72
Improved overall quality of care and coverage with nutritional supplements	13.52	67.59	13.26	66.29
Improved overall quality of care and coverage without nutritional supplements	11.89	59.44	11.43	57.14
Benefit/cost ratio (Low effectiveness of interventions assumed)				
Routine maternity care	11.75	58.73	11.71	58.54
Increased primary-level coverage	9.16	45.79	9.05	45.23
Improved overall quality of care with nutritional supplements	9.66	48.30	9.43	47.14

Improved overall quality of care without nutritional supplements	7.40	37.01	6.94	34.68
Improved quality of CEmOC	5.61	28.07	5.51	27.56
Improved overall quality of care and coverage with nutritional supplements	9.16	45.79	8.93	44.65
Improved overall quality of care and coverage without nutritional supplements	7.92	39.62	7.55	37.75
Benefit/cost ratio (High cost of inpatient bed day)				
Routine maternity care	11.75	58.73	11.71	58.54
Increased primary-level coverage	5.74	28.72	5.79	28.95
Improved overall quality of care with nutritional supplements	10.71	53.56	10.49	52.45
Improved overall quality of care without nutritional supplements	9.13	45.64	8.66	43.29
Improved quality of CEmOC	3.30	16.51	3.31	16.53
Improved overall quality of care and coverage with nutritional supplements	8.04	40.21	8.00	40.02
Improved overall quality of care and coverage without nutritional supplements	7.10	35.52	6.93	34.63
Benefit/cost ratio (Low cost of inpatient bed day)				
Routine maternity care	11.75	58.73	11.71	58.54
Increased primary-level coverage	12.10	60.50	12.08	60.40
Improved overall quality of care with nutritional supplements	10.68	53.40	10.45	52.27
Improved overall quality of care without nutritional supplements	9.13	45.64	8.66	43.29
Improved quality of CEmOC	7.68	38.40	7.62	38.11
Improved overall quality of care and coverage with nutritional supplements	10.70	53.51	10.47	52.33
Improved overall quality of care and coverage without nutritional supplements	9.83	49.14	9.43	47.16

* In this case we assumed that the total fertility rate in developing countries declined at an exponential rate of 1.52% over the past 50 years from 6 to 2.8. It would therefore take South Asia 10.8 years to achieve this TFR of 2.8, and for sub-Saharan Africa, it would take 40.6 years. We then assumed it would take South Asia 10 years to eliminate unwanted pregnancies, and 40 years for sub-Saharan Africa. We allowed the number of DALYs saved due to family planning programs to decline at a constant rate for this many years so that by year 11, there would be zero DALYs left to save in South Asia, and by year 41, this would be the case in sub-Saharan Africa. Maternal health care programs were also reduced to run for 10 years in South Asia and 40 years in sub-Saharan Africa.