THE COST OF GENDER INEQUALITY NOTES SERIES

HOW LARGE IS THE GENDER DIVIDEND? MEASURING SELECTED IMPACTS AND COSTS OF GENDER INEQUALITY

QUENTIN WODON, ADENIKE ONAGORUWA, CHATA MALÉ, CLAUDIO MONTENEGRO, HOA NGUYEN, AND BÉNÉDICTE DE LA BRIÈRE

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BACKGROUND TO THIS SERIES

Reducing gender inequality makes economic sense apart from being the right thing to do. Achieving gender equality and empowering all women and girls is the fifth sustainable development goal and is a top priority for governments. Countries can achieve this goal if they take appropriate steps. This note is part of a series that aims to measure the economic cost of gender inequality globally and regionally by examining the impacts of gender inequality in a wide range of areas and the costs associated with those impacts. Given that gender inequality affects individuals throughout their life, economic costs are measured in terms of losses in human capital wealth, as opposed to annual losses in Gross Domestic Product (GDP) or GDP growth. The notes also aim to provide a synthesis of the available evidence on successful programs and policies that contribute to gender equality in multiple areas and achieve the Sustainable Development Goals (SDGs).

While gender parity in basic education has been achieved globally, in many low income countries, girls' educational attainment remains lower than boys at the secondary level and adult women are less literate than men. Apart from these gender gaps in educational attainment, discrimination and social norms shape the terms of female labor force participation. Women are less likely than men to join the labor force and to work for pay. When they do, they are more likely to work part-time, in the informal sector, or in occupations that have lower pay. These disadvantages translate into substantial gender gaps in earnings, which in turn decrease women's bargaining power and voice. In addition, many girls are married or have children before the age of 18, before they may be physically and emotionally ready to become wives and mothers. Women and girls also face higher risks of gender-based violence in their homes, at work, and in public spaces. Their voice and agency is often lower than that of men, whether this is within the household, at work, or in national institutions. This also affects their children. For example, children of young and poorly educated mothers often face higher risks of dying by age five, being malnourished, and doing poorly in school. Fundamentally, gender inequality disempowers women and girls in ways that deprive them of their basic human rights.

This lack of opportunities for girls and women entails large economic costs not only for them, but also for their households and countries. Achieving gender equality would have dramatic benefits for women and girls' welfare and agency. This, in turn, would greatly benefit their households and communities, and help countries reach their full development potential. It would reduce fertility in countries with high population growth, as well as reduce under-five mortality and stunting, thereby contributing to ushering the demographic transition and the associated benefits from the demographic dividend.

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KEY RESULTS

Gender inequality remains pervasive worldwide. While in some countries boys and men may be at a disadvantage in some areas, in most countries girls and women continue to bear the brunt of gender inequality. For this reason, this study focuses on the impacts of gender inequality on girls and women. To make the case for more and better investments to reduce gender inequality, the study provides estimates of the impacts and economic costs of gender inequality in five main domains of interest: (1) earnings and standards of living; (2) educational attainment, child marriage and early childbearing; (3) fertility and population growth; (4) health, nutrition, well-being, and violence; and (5) agency, decision-making, and social capital. Multiple development outcomes affected by gender inequality are considered. For some outcomes, estimates of impacts – or rather correlations – are obtained using household survey data for more than 100 countries. For other outcomes that may be more salient in developing countries, results are based on analysis for a core set of 19 countries located mostly in sub-Saharan Africa and South Asia (see Appendix 1 for a list of those countries and the data used, as well as the reason why those countries were selected).

The hope is that the associations documented in the study help illustrate the wide-ranging potential impacts and cost of gender inequality, and in this way foster greater policy mobilization towards achieving gender equality. While the study pulls together in one place results on potential impacts and costs in many domains, as noted in Box ES.1, the analysis only provides an order of magnitude of potential impacts and costs, not precise or definitive values. To realize the economic benefits that could arise from reductions in gender inequality, countries will need to make the investments necessary to ensure that girls and women get equal opportunities. Such investments have initial costs, but they pay off through higher standards of living and gains in human capital wealth leading to long-term growth.

BOX ES.1: CONTRIBUTION AND LIMITS OF THE STUDY

This study summarizes findings from research on the potential negative impacts of gender inequality on development outcomes and related economic costs. The fact that investing in girls and women is essential for development is not new. This point was made by pioneers such as Boserup (1970) and more recently by a wide range of authors and organizations including – just to cite a few, Klasen and Lamanna (2009), Duflo (2012), World Bank (2012), Agenor and Canuto (2013), Elborgh-Woytek et al. (2013), Cuberes and Teigner (2015), McKinsey Global Institute (2015), Kabeer (2016), International Labour Organization (2018), Ostry et al. (2018), and World Economic Forum (2020). The purpose of this study is to illustrate the potential negative impacts of not investing in girls and women with more recent survey data, new measures, and for a larger set of countries than done so far. By pulling together evidence on the associations between gender inequality and multiple socio-economic domains in many countries, the analysis can help foster greater mobilization for gender equality. The framework for the study follows similar work devoted to the economic impacts of child marriage (Wodon et al., 2017), and the cost of not educating girls (Wodon et al., 2018). This study integrates and updates results from a previous analysis of the cost of gender inequality in earnings (Wodon and de la Brière, 2018).

As with any empirical work of this nature, estimates of potential impacts and costs are subject to two important caveats. First, estimates from available observational data do not permit establishing causal relationships. Thus, when referring to potential impacts, the analysis should be taken as only suggestive of what might be achieved with gender equality for girls and women and related policy changes. What is measured are associations between aspects of gender inequality and other development outcomes. For several of the outcomes considered, whether these associations reflect casual relationships can be corroborated by evidence from empirical studies that are able more credibly to establish causality. But for other outcomes, such as impacts on decision making, the ability to engage in altruistic behaviors, or perceptions of well-being, fewer such studies are available. Second, simulations of the benefits of achieving gender equality obtained from the estimates of potential impacts do not account for broader effects in the economy arising from an expansion in opportunities for girls and women. The economics literature suggests that these effects could be sizable. For example, labor market earnings for men may be affected when women enter fields in which they were previously rarely active. Such potential general equilibrium effects are not reflected in this study. Assuming no changes for men in various areas may lead to under- or over-estimation of some of the effects suggested in the study.

TWO PILLARS OF THE GENDER EQUALITY AGENDA

- **Gender inequality impacts women throughout their life, but its effects are especially detrimental in adolescence.** The impacts of gender inequality are visible throughout women's lives, from early childhood to old age. This implies that interventions and policies are necessary to reduce gender inequality throughout the life cycle. For example, research suggests that gender stereotypes are formed at an early age. Therefore, finding ways to support changes in attitude at early ages can be highly beneficial later on. At the same time, programs aiming to reduce gender inequality through investments in adolescent girls are especially likely to have high returns (this argument is not new; see for example National Research Council, 2005; Levine et al., 2008; Heckman and Mosso, 2014) There are at least three reasons why investing in adolescent girls – and even in younger girls may be especially beneficial. First, earlier investments tend to bear fruits that persist throughout a woman's life after the intervention. If a girl completes her secondary education, this generates benefits – such as lower fertility and higher labor force participation – for many years afterwards. Second, the cost of interventions in adolescence, or in some cases even earlier, tends to be lower than the cost of interventions implemented later in life. This is especially the case for investments in early childhood to prevent some of the impacts of gender inequality on young

children, boys and girls. Third, at a formative age, interventions may be more successful in influencing values and behaviors. Later in life, it may become more difficult for girls and women to fully benefit from new opportunities provided to them. For example, preventing early marriage may help in strengthening women's agency within the household. This does not mean that new opportunities should not be provided to and investments made in women in adulthood – examples of such interventions are provided in this study. But adolescence is a crucial time during which investments in girls may yield the highest returns.

- **While adopting adequate laws and broad policies is a first step, targeted programs are needed in many contexts.** Assessments of legal frameworks conducted by the Women, Business, and the Law program at the World Bank (2020) suggest that countries are making some progress, albeit slowly, in adopting adequate laws towards gender equality. However, much more is needed as laws by themselves are not sufficient. For example, two thirds of all child marriages take place below the minimum age for marriage adopted by countries in their national legislations. Beyond laws and broad-based policies, targeted interventions are still needed in multiple areas to achieve larger gains towards gender equality. This note focuses especially on two types of programs that may have especially large economic benefits: (i) programs helping adolescent girls to remain in school (or facilitate the school-to-work transition) and delay marriage and childbearing; and (ii) programs enabling adult women to improve their economic opportunities. The focus on these two types of programs does not mean that other interventions are not needed – simply such programs to address gender inequality are known to be fairly effective and have especially large economic benefits (on girls' education and empowerment, see among others Unterhalter et al., 2014; Sperling and Winthrop, 2016; Botea et al., 2017, Evans and Yuan, 2019, and Wodon, 2020).

IMPACTS OF GENDER INEQUALITY BY DOMAIN

- **Lifetime earnings.** The analysis of the impact of gender inequality on earnings is based on measures of human capital wealth, which is the value today of the future earnings of all individuals – men and women – active in the labor force. Globally, for every dollar in earnings expected to be earned by men in the future, women are expected to earn only two thirds of what men earn. There has been only slow progress over the last two decades towards lower gender inequality in lifetime earnings as measured through human capital wealth. In 1995, women were expected to contribute 58 cents on the dollar in comparison to men. Twenty years later the proportion was 63 cents. At current rates of progress (five cents in 20 years), it could take 150 years to reach parity. Two main factors lead women to have lower lifetime earnings than men. First, they have lower labor force participation rates and work fewer hours in the labor market than men. Second, they tend to be paid less well when they are in paid employment. These factors keep many women in a productivity trap driven by many factors, including social norms relegating them to household care responsibilities or unpaid work. However, when measuring the returns to educational attainment for women, they tend to be as large as those observed for men.

- **Educational attainment, child marriage, and early childbearing.** Globally, girls have caught up with boys in attainment for basic education. Nine in ten girls (89.3 percent) complete their primary education, and three in four (76.0 percent) complete their lower secondary education. For boys, the proportions are 89.9 percent and 75.3 percent. However, in low income countries, substantial gender gaps in attainment persist for basic education, especially at the secondary level where the completion rate for girls at 36.9 percent is below that of boys. Part of this gap is due to persistently high rates of child marriage (marrying before the age of 18) and early childbearing (having a first child before 18) in many low income countries. In turn, early childbearing appears to be mostly due to child marriage in many (but not all) countries. Across two dozen low and middle income countries for which estimations have been conducted, three fourths of all instances of early childbearing come after (and therefore appear to be due to) child marriage, rather than the other way around (Wodon et al., forthcoming). The prevalence of child marriage has declined substantially in India and South Asia over the last two decades, although it remains high at 27.0 percent in 2017 (Le Nestour et al., 2019). In sub-Saharan Africa (prevalence at 35.1 percent) and in Latin America and the Caribbean (prevalence at 25.8 percent), much less progress has been

achieved over time towards reducing child marriage.

- **Fertility and population growth.** While reducing fertility rates is not be an objective in itself, high rates of population growth in low income countries is driven by high fertility come with various consequences – not least a stalled demographic dividend and high burdens on governments to maintain (let alone increase) public investments in children as well as adults. Gender inequality has a large impact on fertility and population growth. When girls marry or have children early, they tend to have more children over their lifetime. Lack of access to modern contraceptive use, leading to unmet demand for family planning, also contributes to high fertility rates. Achieving gender equality – for example by ending child marriage and raising educational attainment for girls in countries where they lag behind boys - would change some of the factors that lead to high fertility rates. Estimates from regression analysis for 19 developing countries suggest that achieving gender equality could reduce total fertility on average by 0.70 children per women in those countries. This would represent a reduction in total fertility of 13.1 percent versus current levels for those countries. Analysis also suggests an impact of gender inequality on the likelihood of using modern contraception, although the estimated impacts are smaller: an increase of three percentage points in modern contraceptive use or 12 percent from the (low) base in the countries. Through its potential impact on total fertility, achieving gender equality would lead to a reduction in annual rates of population growth. Estimates for a set of developing countries suggest an average reduction of the annual rate of population growth of 0.26 percentage points with gender equality. This estimate is valid only for those countries and would not extend to developed countries were no large reduction in population growth would come from gender equality.

- **Health, nutrition, well-being, and violence.** By weakening conditions for early childhood development, gender inequality may have negative impacts on young children with lasting negative consequences. The study measures the impact of gender inequality for mothers on the risks of under-five stunting and mortality. The issue is not whether there are differences between boys and girls in those risks. Rather, the focus is on whether gender inequality as it impacts mothers in turns leads to higher risks for both boys and girls. For the same 19 countries, gender equality could help reduce under-five mortality rates by 0.32 percentage point, a reduction of slightly more than five percent from base rates. For under-five stunting, the reduction is estimated at 2.1 percentage points on average, or seven percent from base rates. In other words, while gender inequality affects under-five mortality and stunting, it is probably not one of their main drivers. The study also documents impacts of gender inequality on other aspects of women's lives including the risk of intimate partner and other forms of violence, knowledge of HV/AIDS, and whether children are registered at birth. Finally, the study considers the issue of violence in and around school, and how various forms of violence may affect boys and girls differently.

- **Decision-making and social capital.** Gender inequality is generally associated with lower levels of decision-making for women. A woman's agency or capacity to exercise choice depends on the enabling environment – including policies, regulations, social norms, as well as on access to resources and past achievements. Gender inequality has an impact on resources, for example by contributing to girls' premature school drop-out and lower future earnings. It also affects past achievements (as well as capabilities), as is the case when women do not have access to the same employment or earnings as men. Finally, it affects agency by reducing decision-making in the household. Across the same set of 19 countries as before, achieving gender equality could increase women's decision-making by 24 points on a scale from zero to 100 (as measured through simulations with an index accounting for individual and joint decision-making in various areas). This represents an increase of almost half from base values of the index. As another example of impact, the study estimates that achieving gender equality could lead to a small increase in birth registrations for children. Finally, the study notes that lack of educational attainment for women is associated with a lower likelihood of being able to engage in altruistic behaviors, such as volunteering, donating to charity and helping strangers.

ECONOMIC COSTS OF GENDER INEQUALITY

Estimates of the potential economic costs of gender

inequality are based on measures of national wealth, which is the assets base that enables countries to produce income (Gross Domestic Product or GDP). A country's wealth includes produced capital (assets such as factories, equipment, or infrastructure), natural capital (assets such as agricultural land and other renewable and non-renewable natural resources), and human capital (present value of the future earnings of the labor force). Human capital accounts for two thirds of global wealth. If gender equality in earnings were achieved, countries could increase their human capital wealth, and thereby their national wealth substantially. By reducing population growth, countries would also increase their level of national wealth per capita. This would enable them to strengthen the sustainability of their development path. Specifically, key findings on the economic cost of gender inequality are as follows:

- **Lost human capital wealth due to inequality in earnings (across all countries).** If women were earning as much as men, women's human capital wealth could increase by more than half globally (Table ES.1; see Box ES.2 on the limits of the analysis). Gains would differ between regions and countries, but globally for the 141 countries included in the analysis, the total gain in human capital wealth from gender equality is estimated at US$ 172.3 trillion in 2017 or US$24,586 per person. This estimate, which is in 2014 price levels to be comparable to estimates for 2014 in Wodon and de la Briere (2018), represents about twice the value of GDP globally. Human capital wealth could increase by about one fifth globally under gender equality in earnings, leading to substantial gains in global wealth (including natural and produced capital). Losses in human capital wealth due to gender inequality are higher in absolute value in richer countries because levels of human capital wealth are also higher in those countries. But as a proportion of human capital wealth, losses due to gender inequality are slightly larger in low income countries.

- **Lost human capital wealth due to stunting for young children (in selected developing countries).** Stunting in early childhood leads to losses in earnings in adult life. Estimates from impact evaluations suggest that stunted children may loose up to one fourth of their expected earnings in adulthood due to stunting in early childhood. As gender inequality (experienced by mothers) contributes to high stunting rates (for their children) in developing countries, it reduces expected earnings and thereby human capital wealth for the adult workforce. The economic cost of gender inequality due to its impact on stunting for young children is estimated at US$71 billion in 2014 for a set of 17 developing countries with a population of more than two billion people. This is much smaller than the lost human capital wealth from gender inequality in earnings, but still substantial for the countries affected, and especially the people affected by losses in earnings in adulthood due to stunting during their childhood.

- **Lost welfare from high population growth (in selected developing countries).** Women should have agency in terms of the number of children that they have over their lifetime. Through child marriage and early childbearing as well as lower educational attainment for girls as compared to boys in many low-income countries, gender inequality for girls is associated with higher fertility and population growth. This reduces levels of overall wealth per person in those countries. The gains in wealth per capita that could result from lower population growth by achieving gender equality and reducing fertility are cumulative over time. If gender equality could be achieved, first year benefits from lower population growth are valued at US$80 billion for 16 developing countries with a combined

Table ES.1: Human Capital Wealth by Gender and Potential Loss Due to Gender Inequality (US$ of 2014)

	1995	2000	2005	2010	2014	2017(*)
Human capital wealth per capita, men	56,290	60,940	60,980	62,672	66,832	68,717
Human capital wealth per capita, women	32,584	35,538	36,727	39,498	41,823	42,852
Ratio of women versus men's human capital	58%	58%	60%	63%	63%	62%
Loss as share of baseline human capital	25.9%	25.5%	24.0%	21.6%	21.7%	17.9%
Loss as share of baseline total wealth	17.9%	17.8%	16.0%	13.9%	14.0%	NA
Loss in human capital wealth per capita	23,030	24,603	23,391	22,068	23,620	24,586

Source: Authors. See also Wodon (2018) and Wodon and de la Brière (2018) for estimates up to 2014.
Note: (*) Estimates for 2017 are based on projections taking into account GDP growth between 2014 and 2017. The share of human capital in total wealth in 2017 is not provided because projections are not available for total wealth.

BOX ES.2: THE CHANGING NATURE OF PAID EMPLOYMENT AND OTHER SHIFTS

The estimates of the global cost of gender inequality in earnings are based on current conditions, since they rely on estimations of expected future earnings of today's labor force, with expected earnings measured based on existing household surveys and therefore current conditions. As such, the estimates do not account for potential future shifts, whether those are related to demographic change, the changing nature of work, technological advances, or the potential impact of fragility and conflict among others. For example, men and women are expected to be affected in similar proportions by automation (McKinsey Global Institute, 2019). However, if men are over-represented in emerging technology-related fields with high levels of pay and future opportunities, it could be that gender inequality in earnings may worsen in the future in some countries due to technological change (on how to promote digital jobs for women, see Solutions for Youth Employment, 2018). As another example, although the issue of the potential impact of gender inequality on population growth is considered in this study, the role that population growth will play for human capital wealth through the size of the labor force is not fully taken into account since estimates only consider individuals older than 15. Considering the potential impact of future shifts in the labor market on estimates of gender inequality in earnings is beyond the scope of this study, but those issues could be considered in follow up work.

population of 2.3 billion people. Additional benefits would accrue in subsequent years. This is a mechanical relationship whereby lower population growth results in higher GDP per capita, and it does not capture additional economic gains from lower fertility. These benefits would rise over time as standards of living in the countries improve and population grows, ultimately representing a substantial share of total gains from gender equality in these high population growth countries. However, while very salient to these countries, from a global perspective, the costs related to high population growth are substantially smaller because the countries that would benefit from reductions in population growth have lower levels of wealth than upper middle and high income countries where impacts on population growth would likely be smaller.

- **Budget costs from high population growth (in selected developing countries).** By contributing to high fertility and thereby population growth, gender inequality may contribute to lower quality services provided by governments to their population. This is because higher population growth may require spreading budget resources more thinly to provide basic education to ever larger cohorts of students. While reducing population growth is not an end in itself, if population growth were lower by addressing unmet contraception needs and empowering women in high fertility contexts, more resources could be available to invest in higher quality services. The savings that could be reinvested in higher quality services can be estimated based on the reduction in the population to be served when population growth is itself reduced by achieving gender equality. For savings related to the provision of public education, benefits start to be reaped six years after gender equality is achieved since this is the time needed for fewer children to enter primary school. Savings are estimated as the reduction in the anticipated cost of reaching universal secondary education by 2030 in 16 countries. The benefits increase over time and could reach up to $27 billion by 2030 in those countries. This is an upper bound estimate of potential savings since countries may not reach universal secondary education by 2030. But this is by no means a negligible amount that could be reinvested in improving the quality of the education being provided.

- **Difference between developed and developing countries.** Thereis a major difference between developed and developing countries in the economic costs generated by gender inequality. In developed countries, costs related to gaps in labor market earnings tend to dominate, given that other costs (as measured in this study) tend to be small since the countries have lower levels of population growth and under-five stunting, among others. By contrast, in developing countries,

while costs associated with gender inequality in earnings are also high, costs related to population growth and under-five stunting are far from being negligible, and in some cases may exceed costs related to gender gaps in earnings, at least over a sufficiently long period of time. The implication is that in developed counties interventions to reduce the costs of gender equality may focus in large part on labor market earnings and other factors affecting income levels. However, in developed countries, and especially in low income countries, high rates of population growth as well as poor education, health, and nutrition outcomes must be tackled as well. This is why in low income countries, investments in adolescent girls are so important, including to improve educational attainment, reduce child marriage, and prevent early childbearing.

SUMMARY OF KEY FINDINGS

Table ES.2 provides the main estimated potential impacts of gender inequality by domain, together with an indication of country coverage for the estimations. This is done by distinguishing estimates based on global data from those based on a core set of up to two dozen developing countries. Potential impacts are summarized by showing gains from achieving gender equality in comparison to current conditions. It should again be emphasized that what is measured when using regression analysis is associations, not necessarily causal impacts. In addition, simulations of the benefits of achieving gender equality are based on simple comparative statics – they do not take into account potential broader effects in the economy arising from, for example, an expansion in opportunities for girls and women. Assuming no changes for men in various areas such as labor force participation and earnings may lead to under- or over-estimating some of the benefits from gender equality. Finally, for some indicators, especially in the case of agency and decision-making, and social capital and institutions, the data pertain to reported behaviors and perceptions, thereby making interpretation more tentative. As a results, estimates of potential impacts and for some of the impacts associated economic costs are not meant to be precise since they depend on models and assumptions. But they nonetheless demonstrate that the potential economic impacts and costs of gender inequality are high not only for girls and women, but also for their communities and for societies overall.

SELECTED POLICY OPTIONS TO ACHIEVE GENDER EQUALITY

Since gender inequality affects girls and women in virtually all aspects of their life, a wide range of interventions to reduce gender inequality and mitigate its impacts should be implemented. But to keep the discussion of policy options manageable, the focus is on three types of investments along the life cycle: (1) Investments in early childhood development to reduce the impact of gender inequality on young children, including through the provision of care for very young children; (2) Investments in adolescent girls to delay marriage and childbearing while improving education opportunities and reducing fertility; and (3) Investments in adult women to improve employment and earnings opportunities. This categorization in three buckets is for expository purposes. In practice the various types of polices matter for all the impacts and economic costs identified in the study. The focus on a subset of the investments needed to achieve gender equality does not mean that other types of investments are not important or needed. But because these three types of investments are related directly to identified impacts and economic costs of gender inequality in this study, these are the investments considered in more detail. In addition, the study suggests to target high prevalence areas for gender inequality or some of its manifestations through interventions and prepare diagnostics and strategies to reduce gender inequality.

- **Investing in young children.** Gender inequality manifests itself from early childhood and even before, as in the case of "missing girls" due to parental preferences for boys. After birth, girls may be at a disadvantage as they may not benefit from the same investments as boys. In addition, and this is where this study provides measures of impact, gender inequality as experienced by mothers may affect both boys and girls, as is the case when early childbearing and low educational attainment for mothers lead to higher risk of under-five mortality and stunting. In order to prevent such negative impacts, investing in young children is one of the best investments that countries can make.

Table ES.2: Selected Potential Impacts and Costs/Benefits from Gender Equality

Domain	Coverage	Potential Impacts
Earnings and standards of living	Global	Increase in women's human capital wealth of more than half
	Global	Gain in women's labor force participation and full-time work of 20 percentage points
	Global	Substantial reduction in poverty from higher earnings and lower fertility
Educational attainment, child marriage and early childbearing	Global	Elimination of child marriage
	DCs	Reduction in early childbearing by at least three fourths
	Global	Gains in educational attainment for girls in low-income countries
Fertility and population growth	DCs	Reduction in total fertility by 13 percent
	DCs	Increase in contraceptive use by 12 percent
	Global	Reduction in population growth rate by 0.26 percentage point in 16 countries
Health, nutrition, well-being, and violence	Global	Improvement in women's health and psychological well-being
	DCs	Reduction in under-five mortality rate by 5 percent
	DCs	Reduction in under-five stunting rate by 7 percent
	DCs	Increase in women's knowledge of HIV/AIDS and reduction in violence
Agency, decision-making, and social capital	DCs	Increase in women's decision-making by 45 percent
	Global	Improvement in women's ability to assess quality of basic services
	DCs	Increase in likelihood of birth registration by 5 percent
	Global	Increase in women' reported ability to engage in altruistic behaviors
	Global	Increase in women's reported ability to rely on friends when in need
Potential economic costs	Global	Loss in HC wealth from earnings inequality of US$172 trillion
	DCs	Loss in HC wealth from stunting of US$71 billion in 17 countries
	DCs	Loss in wealth per capita equivalent to US$80 billion in first year in 16 countries due to high population growth (with cumulative effects over time)
	DCs	Budget costs in education of up to US$27 billion by 2030 in 16 countries

Source: Wodon (2018).
Note: DCs = Developing countries.

A child's earliest years present a unique window of opportunity to address inequality (including gender inequality), break the cycle of poverty, and improve a wide range of outcomes later in life. Denboba et al. (2014) suggest a list of 25 interventions considered as essential for young children. These interventions can be delivered through five integrated packages at different stages in a child's life: (i) the family support package, which should be provided throughout the ECD period and which includes interventions to provide care options for young children that enable women to work, (ii) the pregnancy package, (iii) the birth package from birth to six months, (iv) the child health and development package, and (v) the preschool package. Of special importance for the focus of this study are interventions related to planning for family size and spacing, given that a woman's ability to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy, in addition to the impacts and costs of gender inequality through higher fertility as estimated in this study.

- **Investing in adolescent girls to delay marriage and childbearing while also improving their education opportunities.** Three-pronged strategies are likely to be needed to invest in adolescent girls and provide them with better opportunities in life: (1) General basic conditions must be met for access to education and learning; (2) Targeted interventions must be implemented to reach vulnerable girls; and (3) Efforts must be undertaken to change gender-based social norms and gender-based laws, which affect all women but especially adolescent girls (for a review of constraints and promising interventions with a focus on Africa, see also Chakravarty et al., 2017).

  - *Ensuring general conditions for access to education and learning.* Several reviews discuss the basic general conditions required for improving girls' education (Unterhalter et al., 2014; Sperling and Winthrop, 2016; Evans and Yuan, 2019; Wodon, 2020). Some of the interventions required to ensure these basic conditions are met are likely to be as effective to improve education for girls as interventions targeted to girls specifically (Evans and Yuan, 2019). In many countries with a high prevalence of child marriage and low educational attainment for girls, there is a need to build secondary schools closer to where girls (and boys) live or provide modes of transportation and in some cases boarding to enable them to attend schools, especially at the secondary level. Providing adequate water, sanitation and hygiene facilities for girls is essential for school infrastructure. Addressing prevention and responses to the risk of violence and sexual harassment either at or en route to school is also critical for school systems and communities to address. It is also essential to ensure that schools improve learning outcomes and provide girls (and boys) with appropriate skills. Among various entry points that can be used to that end, the following can be mentioned (1) reducing disadvantages that girls face in remote communities, often due in part to poor targeting of Government resources; (2) creating a more inclusive school culture for girls – including protocols for gender-based violence prevention and response; (3) providing girls with role models—including through female teachers; and (4) raising the returns to secondary education for women through better employment opportunities. This list is not exhaustive and entry points vary between countries. In addition, many interventions that can benefit girls need not be specific to girls. For example, cash transfers for access to schooling or pedagogical interventions to improve learning may benefit boys as well as girls, and in some case may lave larger impacts than girls-specific interventions.

  - *Implementing interventions to reach especially vulnerable girls:* The focus here is on delaying marriage and early childbearing, while also improving knowledge of sexual and reproductive rights and health. The study outlines three types of interventions that were recently reviewed on the basis of the available evidence from experimental or quasi-experimental studies: (1) There is a need for interventions to expand economic opportunities for adolescent girls who dropped out of school and who are unlikely to be able to return; (2) Imparting adolescent girls with life skills and reproductive health knowledge is also needed, whether girls are in school or out of school. Evidence suggests that safe space clubs where girls may discuss issues of sexual and reproductive health as well as other topics with female mentors may be an effective means of achieving this; (3) However, according to the literature, the most effective targeted

interventions to delay marriage and childbearing are those that enable girls to remain in school, especially through incentives offsetting the out-of-pocket and opportunity costs of schooling (see Botea et al., 2017, for a more detailed review, as well as Bandiera et al., forthcoming, and Baird et al, 2011, as examples of interventions).

- *Changing gender-based social norms and gender-biased laws:* Child marriage, early childbearing, low educational attainment for girls, and other forms of gender inequality are rooted in social norms that perpetuate gender discrimination. To tackle this challenge, beyond general conditions that education systems should meet and targeted interventions to reach vulnerable girls, additional community-based interventions that involve all members of the community may be an effective means of changing these norms (see for example the review by Jayachandran, 2019). Such interventions should target men and community leaders and not only women. Finally, adequate laws – for example on the minimum age for marriage without exceptions for parental and judicial consent, but also in many other areas related to work, inheritance, and many other aspects of women's lives are also essential as noted among others in successive Women, Business and the Law reports, but often not sufficient on their own to achieve change. Processes for registering marriages and births may be instrumental in ensuring that legislation related to the minimum age for marriage are respected.

- **Investing in women to improve employment and earnings opportunities.** In middle and high income countries, gender parity has been achieved in educational attainment, with girls even edging boys in many countries. Yet this does not mean that women do as well as men in labor markets, as documented by human capital wealth gaps between men and women. A review of the literature prepared for this study suggests that interventions can be implemented in three main areas: (1) reducing time spent by women in unpaid work and redistributing care responsibilities within households and between households and public and private service providers; (2) increasing women's ownership and control over productive assets, especially finance; and (3) addressing a variety of market and institutional failures.

  - *Reducing, redistributing and recognizing (three Rs) unpaid work and care:* Elson (2017) suggested a "three Rs" approach to close the gender gap. Time use surveys show that women spend substantially more time in unpaid home-based work than men, and consequently less time in market work. Reducing unpaid work for women would free time for market work or other activities. Various types of policies can help in that regard. This includes providing better access to basic infrastructure services (water, electricity, energy) as well as child and elderly care services; enhancing women's mobility through better and safer modes of transportation and ICT; and expanding programs such as parental leave, flexible schedules, and appropriate legislation on retirement ages while minimizing potential downsides for women in terms of slower career progression or occupational segregation. Among those interventions, quality care services are especially important as a shift in the proportions of market work, non-market work, and leisure time for women requires a double redistribution of care work, not only within households to adult male members but also between households and public and private service providers.

  - *Facilitating access to productive assets:* Especially in low income countries, women's employment tends to be informal and concentrated in agriculture (and to some extent services). Women farmers often generate less income than men due to unequal access to inputs and lower returns to these inputs. Improving ownership of, secure access to, and control over good quality land requires strengthening women's land rights in legislation and property registries (for a review with a focus on Africa, see O'Sullivan, 2017). Also important is the acquisition of soft technical and managerial skills and access to finance among others through micro-credit and the promotion of alternative collateral. Bundled services including (in-kind) capital transfer, asset-specific training, technical assistance, stipends for one to two years, and health information and insurance as well as life skills training can help push very poor women out of poverty traps with positive economic outcomes and increased savings. High-quality business management training of significant duration can benefit female entrepreneurs, as can demand-driven job services tackling barriers to employment.

- *Solving market and institutional failures:* Both types of failures can be pervasive with serious implications for gender inequality. Access to information to address occupational segregation and pay gaps can help improve gender equality. Access to social capital (networks, role models, and mentorship) also matters. Self-help groups foster increased solidarity between peers, independent financial decision-making, and greater respect for the women within their households and communities. Group approaches may be especially effective, for instance in agriculture as illustrated by production cooperatives, but also in finance and entrepreneurship. Another area for reform is legal and fiscal frameworks including labor market policies ensuring equal opportunities, laws about access to capital and justice, and policies targeted at advancing women to top positions. In OECD countries that have more developed tax systems, policies should avoid penalties for women as "second earner", while earned income tax credits can provide an income subsidy for low-earner families and encourage women to enter the labor force. Finally, ensuring safety and preventing gender-based violence at home, at work, and in public spaces is also essential (this requires interventions beyond solving market and institutional failures).

- **Targeting:** Finally, the study makes the case for targeting geographic areas when implementing interventions and preparing cross-sectoral strategies to reduce gender inequality. Ideally, interventions should have universal coverage, but in practice, resources are often limited. Given the importance of achieving change at the community level, including in terms of social norms, targeting interventions in priority areas can help to create tipping points. In addition, although this is a generic point, it is worth noting that preparing a country diagnostic of gender inequality and drafting an evidence-based strategy towards gender equality can help conduct the dialogue needed to achieve consensus and commitment.

CONCLUSION

Gender inequality has negative impacts for girls and women throughout their lives and these impacts result in large costs to economies. These impacts were documented in this study in five main areas: (1) earnings and standards of living; (2) educational attainment, child marriage and early childbearing; (3) fertility and population growth; (4) health, nutrition, well-being, and violence; and (5) agency, decision-making, and social capital. The potential economic costs of gender inequality in terms of lost wealth for countries are substantial. But solutions are available to achieve gender equality. Along a simple life cycle model, the study considered three main types of interventions: (1) Investments in early childhood development to reduce the impact of gender inequality on young children; (2) Investments in adolescent girls to delay marriage and childbearing while also improving education opportunities; and (3) Investments in adult women to improve employment and earnings opportunities and increase human capital wealth. In addition, the study also suggested to target high prevalence areas for gender inequality or some of its manifestations through interventions and prepare strategies to reduce gender inequality. This is not only the right thing to do, it also makes sense from an economic point of view.

INTRODUCTION

Substantial progress has been achieved towards gender equality over the last two decades. As just one example, according to data from the World Bank's World Development Indicators, nine in ten girls (89.3 percent) complete their primary education globally, and three in four (76.0 percent) complete their lower secondary education. For boys, the proportions are very similar at 89.9 percent and 75.3 percent. In other words, girls have caught up with boys in educational attainment globally, and in some countries such as those in the Caribbean girls are often doing better than boys. However, in many low income countries, substantial gender gaps persist in educational attainment to the detriment of girls, especially at the secondary level where the completion rate for girls at 36.9 percent is below that of boys. And in many other areas, girls and women remain at a disadvantage versus boys and men. Often this disadvantage is largest in the poorest countries.

The fifth Sustainable Development Goal calls for gender equality and empowering all women and girls (Box 1). Countries have a long way to go to achieve that goal. A range of dire statistics exists on aspects of gender inequality ranging from child marriage and female genital mutilation to legal discrimination, intimate partner and other forms of violence, lack of political voice, lack of access to contraception and health care, and lack of access to land. As noted in Wodon and de la Brière (2018) in the first note in this series on the cost of gender inequality globally, inequality in earnings between men and women could cost countries up to US$160 trillion in lost human capital wealth measured as the present value of the future earnings of the labor force using data up to 2014. This note updates those estimates to 2017 and extends the analysis of the impacts and economic costs of gender inequality beyond labor earnings to a larger set of domains.

BOX 1: DEFINING GENDER EQUALITY

Gender inequality can be defined in various ways. This study follows World Bank (2012, 2016), whereby gender refers to the social, behavioral, and cultural attributes, expectations, and norms associated with being male or female. Gender equality (or inequality) then refers to how these factors determine the way in which women and men relate to each other and to the resulting differences in power between them. This definition is very broad, but guidance on how the concept of gender equality can be operationalized is available from the goals adopted by the international community in 2015 under the Agenda 2030 or Sustainable Development Goals (SDGs).

The fifth goal - to achieve gender equality and empower all women and girls - includes six targets: (1) Ending all forms of discrimination against all women and girls everywhere; (2) Eliminating all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation; (3) Eliminating all harmful practices, such as child, early and forced marriage and female genital mutilation; (4) Recognizing and valuing unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate; (5) Ensuring women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life; and (6) Ensuring universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences. In addition, the goal calls on member states to (i) Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws; (ii) Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women; and (iii) Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels

This study does not consider all the aspects of gender inequality that have been incorporated in the fifth goal under the SDGs as well as other SDGs such as those for education and health, but it considers key dimensions that tend to have large economic costs. This includes gaps by gender in labor market earnings (in part due to gaps in educational attainment but also due to lower labor force participation and lack of full-time work for women in comparison to men), and the effects of gender inequality on population growth, health outcomes including for children of young mothers, and opportunities for adolescent girls.

Gender inequality has a range of potential negative impacts throughout women's lifetime not only for themselves, but also for their children and households, their communities, and societies. The fact that investing in girls and women is smart economics is not news. The point has been made in earlier studies (see Box 2). The contribution of this study is to document the potential negative effects of gender inequality using new measures and with more recent survey data. The hope is that by illustrating the wide-ranging potential impacts and costs of gender inequality, the analysis will accelerate policy mobilization towards achieving equality and providing to girls and women the opportunities they deserve.

The primary objective of this study is to estimate some of the economic costs of gender inequality. In addition, the study relies on reviews of the literature to provide guidance on some of the interventions that could help achieve gender equality, and thereby prevent those losses. The guidance provided on programs and policies is not meant to be exhaustive, and the study does not try to identify some of the deep-seated factors that contribute to gender inequality. For example, some governments have adopted national strategies to end child marriage and teenage pregnancies. Improving girls' education is also a priority of many governments. Unfortunately, the cultural, economic, and social conditions that have historically contributed to poor outcomes for girls remain strong in many countries due to persistent social norms (see Box 2).

BOX 2: SOCIAL NORMS, VOICE, AND AGENCY

A large body of work has been conducted on how gender inequality affects development outcomes and how various policies and programs could reduce the magnitude of such inequality - see for example World Bank (2001, 2012, 2016), Klasen and Lamanna (2009), Duflo, (2012), Agenor and Canuto (2013), Elborgh-Woytek et al. (2013), Cuberes and Teigner (2015), McKinsey Global Institute (2015), Kabeer (2016), International Labour Organization (2018), Ostry et al. (2018), and World Economic Forum (2018). Focusing specifically on social norms, voice and agency, Klugman et al. (2014) document constraints facing women and girls worldwide, from high levels of gender-based violence to social norms and laws that curtail their decision-making in multiple areas. The report notes that constraints faced by women and girls stem from their limited endowments (health, education, and assets) and economic opportunities. In addition, social norms about gender roles are also limiting. For example, even when women work outside of the home, they typically remain responsible for housework and child care. Social norms often restrict women's mobility. They tend to be under-represented in politics and government. Unequal power relationships lead to gender-based violence, and legal discrimination remains pervasive, as is the case when women need their husband's consent to work. Lack of protection and discrimination under the law interacts with social norms, as is the case when women have limited land rights.

Social norms tend to be reinforced by the community where girls and women live, including by teachers and the education system, or employers and the labor market. This is often recognized, but not always acted upon in terms of finding adequate levers to enact change. One of the implications of the deep-seated nature of social norms is that even if some specific manifestations of gender inequality were to be abolished, underlying issues may still remain. For example, even if child marriage were ended, say by managing to keep girls in school until the age of 18, they might marry immediately after reaching 18 and have children soon after that, so that their voice and agency might still be curtailed. This is why beyond tackling specific forms of gender inequality, broader social norms must be addressed. Yet outlining how this can successfully be done is beyond the scope of this note. Other recent studies inventory the evidence on what works to shift gender social norms (see for example Dhar et al., 2018; Marcus, 2018; and Overseas Development Institute, 2015).

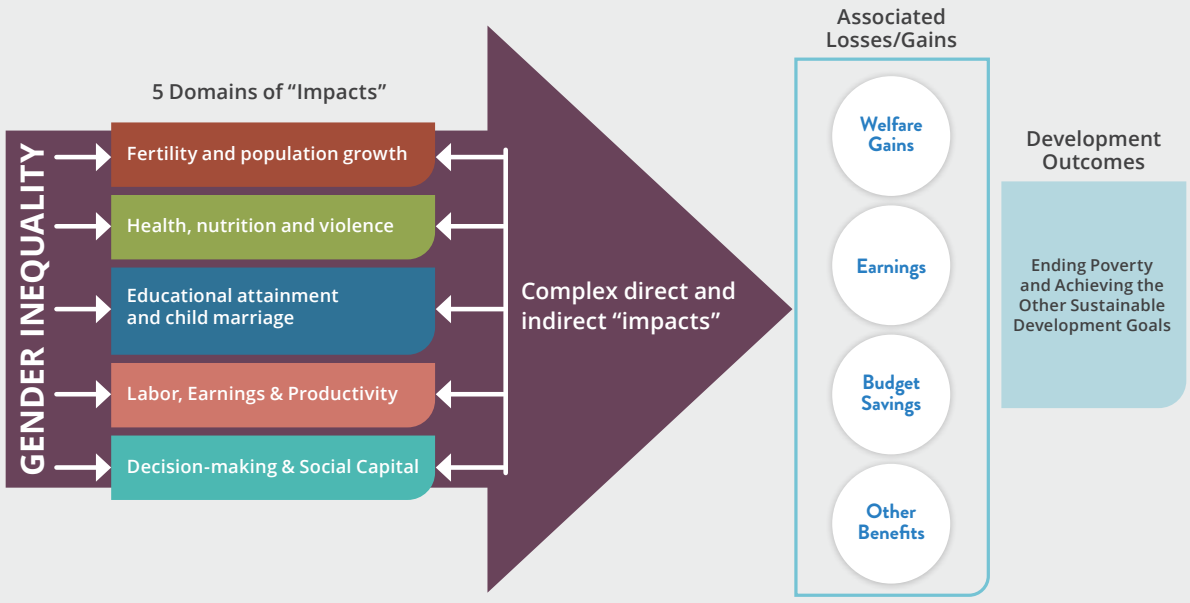
FRAMEWORK AND METHODOLOGY

The framework that guides the analysis is provided in Figure 1 and builds on two recent studies at the World Bank. The first study focused on the economic impacts of child marriage and was implemented jointly with the International Center for Research on Women (Wodon et al., 2017). The second study considered the cost of not educating girls (Wodon et al., 2018). Building on past work, five domains of potential impacts of gender inequality are considered: (1) fertility and population growth; (2) health, nutrition, and violence; (3) educational attainment and child marriage; (4) labor, earnings, and productivity; and (5) decision-making and social capital. The potential impacts of gender inequality in these domains are estimated using regression analysis and a wide range of datasets (see Appendix 1 for a description of the main datasets and more details on methodology). While the five domains are related to each other in various ways as noted in Box 3, for simplicity, key findings are presented in this study sequentially for each domain considered individually.

As done in previous studies on the economic impacts of child marriage (Wodon et al., 2017) and the cost of not educating girls (Wodon et al., 2018), four main types of costs are considered: (i) higher earnings; (ii) higher "welfare" or standards of living due to lower population growth; (iii) budget savings or costs; and (iv) other benefits, including in terms of individual feelings and perceptions. The focus on these four types of costs is driven in part by data availability, but also by an attempt to avoid double counting impacts and associated costs. This is done by considering separately the effects of gender inequality first on incomes or expenditures as the numerator of measures of long-term well-being (human capital wealth per capita), and next on the population that benefit from incomes or expenditures as the denominator of measures of well-being (see Appendix 1 for more details). In Figure 1, the framework is presented in terms of the benefits from gender equality. In this note, we will in most cases use the language of costs associated with gender inequality, but the approach is the same. In order to measure long-term as opposed to annual costs, the valuation of costs relies on estimates of the changing wealth of nations, which has a number of advantages as discussed in Appendix 2 (see Hamilton et al., 2018, on estimates of human capital wealth).

Finally, gender inequality has implications for poverty and inequality. By raising standards of living through higher earnings and lower population growth, achieving gender equality would lead to reductions in poverty (on the link between fertility and poverty in Africa, see for example Beegle and Christiaensen, 2019). Furthermore, since girls and women from lower socio-economic backgrounds are often the most affected by gender inequality, achieving equality would also contribute to reducing extreme poverty and achieving the other targets under the Sustainable Development Goals.

Figure 1: Conceptual Framework



Source: Wodon and de la Brière (2018).

Several dozen different indicators or outcomes of interest are used to capture the potential impacts of gender inequality. Most indicators are objective measures, including total fertility rates, women's earnings, rates of under-five mortality and stunting. A few of the indicators and rates are perceptions-based or more tentative, such as measures of the ability of women to engage in altruistic behaviors. While not all indicators may be equally important for development, poverty reduction, and shared prosperity, conducting analysis for a large set of indicators helps to convey the fact that the consequences of gender inequality are truly pervasive and wide-ranging.

One last point on methodology is worth highlighting (see Appendix 1 for details). For some indicators, simple statistics are used to measure the impacts of gender inequality, while for other indicators, regression analysis is used. When indicators are available for men and women (or boys and girls) and differences in these indicators can be considered as a prima facie evidence of gender inequality impacts, statistical comparisons are used. In some cases however, while differences in outcomes may be small by gender, gender inequality may still affect outcomes for both genders. For example, child marriage and early childbearing have negative effects on the children of young mothers, whether those children are boys or girls. In those cases, the impact of gender inequality is measured through regression analysis instead of statistical comparisons between boys and girls since those comparisons would miss much of the effects of gender inequality. In other cases, outcomes are observed only for girls and women, either because some outcomes affect women only or mostly (as in the case for early childbearing and fertility rates), or because available data sources collect information for women but not men (as is often the case for intimate partner violence). In those cases too, the potential impact of gender inequality is measured through regression analysis instead of statistical comparisons since such comparisons are not available (see

BOX 3: INTERDEPENDENCE BETWEEN DOMAINS AND BENEFITS FROM QUALITATIVE DATA

For simplicity, findings on the potential impacts of gender inequality are presented in this study for each domain of potential impact separately. Yet in practice, the various domains are interdependent. To illustrate how this is the case, consider a simple life cycle approach. Social norms may contribute to disadvantage for girls early on, but they emerge in full force in adolescence when in many contexts, girls may have to get married as children if they drop out of school. This contributes to early childbearing and higher total fertility over their lifetime. In turn, having many children may affect women's ability to participate in the labor market in adulthood, and low educational attainment reduces their earnings when working. This may affect decision-making within the household, voice, and social capital throughout women's life. Finally, early childbearing, high fertility rate, and income losses also have intergenerational effects, contributing (among others) to higher risks of child mortality and malnutrition for children of poorly educated mothers.

The challenges and obstacles faced by girls and women due to gender inequality are multifaceted. They reinforce each other, leading to a diminished ability to break out of patterns of disadvantages. In some cases, interdependence between domains is explicitly modeled. This is the case when considering the potential combined impacts of low educational attainment and child marriage, both markers of gender inequality, on other outcomes. But there are limits to the extent to which the interdependence between domains can be considered without making the analysis overly complex.

Qualitative data and narratives are another way to illustrate interdependence between domains. For this reason, selected quotes from qualitative data collected as part of the work program of which this study is part, as well as quotes from a few other existing studies, are provided.

Appendix 1 for more details on the methodology used for the analysis). When estimations of the impacts of gender inequality are based on regression analysis, the results are subject to important caveats. First, estimates from available observational data do not permit establishing causal relationships. Thus, when referring to potential impacts, the analysis should be taken as suggestive of what could be achieved with gender equality. Second, estimates of potential impacts do not account for broader effects in the economy arising for example from better education and employment opportunities for women. Such effects could happen if the economy fails to grow at a rate that can generate sufficient jobs to absorb the more educated women entering the labor market, and/or if the expansion of employment opportunities for women were to negatively affect earnings for men. The analysis also does not consider how changes in situations for men could in turn affect women.

Thus, estimates only provide orders of magnitude of potential impacts. They are not meant to be precise nor definitive or ultimate values that account for general equilibrium effects. This approach is by no means perfect, and different interpretations of what gender equality entails could be advanced. But the approach is sufficient to provide tentative estimations of the impacts of gender inequality, noting that subsequent work with different assumptions could generate different results. In what follows, the analysis of the potential impacts of gender inequality on development outcomes is presented according to the five domains highlighted in Figure 1. Thereafter, estimates of economic costs are provided for some of these potential impacts as shown in Table 1. The last few sections of the study are devoted to a discussion of selected policy options to achieve gender equality.

DOMAIN 1: LABOR, EARNINGS, AND PRODUCTIVITY

LIFETIME EARNINGS AND HUMAN CAPITAL WEALTH

The first note in this series on the cost of gender inequality focused on losses in human capital wealth due to gender inequality in earnings (Wodon and de la Brière, 2018). These estimates of potential costs were estimated at US$160 trillion in 2014 and are updated in this note to 2017 based on a simple extrapolation that accounts for recent growth in GDP per capita and population across countries. Beyond earnings, the note covers other areas where gender inequality may have impacts and costs. Before doing so, this section first provides the rationale for relying on measures of countries' wealth, and especially human capital wealth.

Typically, researchers looking at the economic impact of gender inequality on development have focused on annual measures of earnings, national income, or growth in income (e.g. Elborgh-Woytek et al., 2013; Cuberes and Teigner, 2015; McKinsey Global Institute, 2015). Many of these analyses focus on losses in Gross Domestic Product (GDP) from inequality between women and men in labor markets. This focus on income is natural since GDP is the standard measure according to which the economic performance of countries is measured. Yet GDP growth is a short-term measure of performance, which may be misleading about the health of an economy because it does not reflect whether a country is investing in the assets base that will sustain its

Table 1: Examples of Cost Estimations

Category	Estimation
Welfare gains	Higher wealth per capita due to lower population growth
Earnings gains	Higher lifetime earnings for women from gender equality in earnings
Budget savings	Lower public spending for education due to lower population growth

Source: Authors

long-term growth. A country could deplete its natural capital base or fail to invest in its people and still be able generate high rates of GDP growth in the short run, although probably not in the long-run. Following up on Wodon and de la Brière (2018), this note focuses on human capital (the wealth approach) by measuring lifetime losses in earnings, instead of annual flows (the GDP approach). More precisely, human capital wealth is defined as the present value of the future earnings of today's labor force, considering individuals aged 15 and above.

At least three arguments justify using a wealth (stock) approach as opposed to a GDP (flow) approach to measure losses in earnings due to gender inequality. First, using a flow approach does not reveal the full magnitude of the losses in earnings faced by women throughout their working life. Estimates of losses from gender inequality in labor markets based on human capital wealth are substantially larger than those based on GDP simply because wealth is larger than GDP. The full magnitude of the losses from gender inequality appears only when considering human capital wealth or women's earnings over their lifetime. Second, a flow approach tends to emphasize losses for individuals at the peak of their earnings, since they account for a larger share of the labor earnings in GDP. Again, it seems more appropriate to look at individuals' lifetime earnings to better reflect expected losses from gender inequality. This should give a higher weight to younger individuals than is the case with the flow approach. Third, and perhaps most fundamentally, a wealth approach is forward-looking as it emphasizes sustainability since GDP, or more precisely the consumption component of GDP, is essentially is the annual return or income that a country reaps from its wealth, the assets base that it uses for production.

Wealth consists of natural capital such as agricultural land, forest, oil, gas and minerals, to give a few examples. It also consists of produced capital – think about infrastructure, machinery, factories, or buildings. Finally, wealth consists of human capital, such as a well-educated and productive labor force. These three categories – produced, natural, and human capital, are the main components of the changing wealth of nations, that together with net foreign assets, provide the assets base to produce GDP capita from year to year.

Given the advantages of wealth accounting over annual earnings measures to measure losses in earnings due to gender inequality, we rely in this note on research recently completed by the World Bank on the *Changing Wealth of Nations* study (Lange et al., 2018). Building on two previous reports (World Bank, 2006 and 2011), the *Changing Wealth of Nations* 2018 study covers the period 1995 to 2014. It includes not only estimates of produced capital and natural capital, as did previous reports, but also estimates of human capital following the approach suggested by Jorgensen and Fraumeni (1992a, 1992b). The analysis is based on data for 141 countries accounting for more than 95 percent of the world's population. Estimations of human capital are based on household survey data. It should be noted however that there are limitations to the methodology. For example, due in part to limits in the data available in many household surveys, the estimation of human capital wealth does not place a value on non-employment work by women such as household work and child care.

GENDER GAPS IN HUMAN CAPITAL WEALTH

How large are the potential losses in wealth due to gender inequality in earnings? Global estimates in absolute values will be provided in a subsequent section with other estimates of costs from gender inequality. In this section, estimates are provided in per capita terms together with a discussion of some of the factors leading to losses. Table 2 provides the estimates of human capital wealth per capita of men and of women. The estimates represent the present value today of the expected future earnings of the adult labor force (age 15 and above) divided by the total population in the country.

Consider first estimates for 2014 as provided in Table 2, based on Wodon and de la Brière (2018). Globally, human capital wealth per capita was estimated at US$108,655 in 2014. Of this amount, US$66,832 was attributed to men's future earnings, while US$41,823 was attributed to women's future earnings. For every dollar in earnings expected to be contributed by men in the future, women are expected to contribute only 63 cents. This suggests that women globally will earn over their remaining time in the labor force slightly less than two thirds of what men can be expected to earn. This represents a high level of gender inequality in expected future earnings. There has been some progress over the last two decades towards lower gender inequality in lifetime earnings as are measured through human capital wealth, but progress has been slow. In 1995, women were expected to contribute 58 cents in human capital wealth on the dollar in comparison to men. Twenty years later the proportion was 63 cents. At current rates of progress (five cents in 20 years), it could take

almost 150 years to reach parity in contributions to human capital wealth for both men and women.

The World Bank is in the process of updating its estimates of the changing wealth of nations, including human capital wealth, but these estimates are not yet available. For this study, estimates of human capital wealth by gender for 2017 are based on projections. The projections rely on gender ratios observed for 2014 but estimates of total human capital wealth adjusted to take into account real GDP growth as well as population growth between 2014 and 2017. These projections are tentative, but they are likely to be reasonably accurate given that levels of GDP per capita across countries explain close to 95 percent of the variation in the estimates of human capital wealth per capita across countries, as mentioned in Appendix 2. Gains in real GDP per capita between 2014 and 2017 can thus be used as proxies for gains in human capital wealth per capita, and levels of aggregate human capital wealth can be obtained by simply multiplying projected human capital wealth per capita by a country's population, taking into account population growth between 2014 and 2017. As noted in Box 4, one of the limitations of the analysis is that it is based on current conditions, and not on conditions that may prevail in the future given potential changes in the nature of work, among others (World Bank, 2019a).

To compute the potential losses in human capital wealth due to gender inequality, we simply estimate how much more human capital wealth countries would have if women were earning as much as men. As noted in Box 5, this is a strong assumption, but it has the merit of simplicity and transparency. On a per capita basis, gender inequality could under this assumption lead to a loss in human capital wealth of US$23,620 per person in 2014 (losses in human capital wealth per capita differ slightly from the gap in human capital wealth by gender due to differences in the number of men and women). This loss is projected to have increased to US$24,586 per person in 2017 due to growth in GDP per capita and labor earnings in real terms between 2014 and 2017.

As a share of baseline wealth, losses from gender inequality in earnings represent 21.7 percent of the baseline human capital wealth in 2014, and 14.0 percent of the baseline total wealth per capita when produced capital, natural capital, and net foreign assets are also included in the analysis. The projected estimate for 2017 is very similar for the share of baseline human capital wealth (no estimates are provided for the share of total wealth lost in 2017 since estimates of the changing wealth of nations for that year are not yet available). These losses as a share of baseline wealth tend to be slightly lower in 2014 (and 2017) than in 1995. This is in part because as just mentioned, there is a slow movement towards more gender equality in earnings in many countries over time, which makes the losses due to gender inequality slightly smaller. But in addition, human capital in high income countries has been declining slightly in recent years due among others to ageing and a reduction in the share of labor income in GDP following the great recession. This also contributed to a small reduction in the losses from gender inequality over time as a share of baseline wealth estimates.

BOX 4: THE CHANGING NATURE OF WORK AND OTHER SHIFTS

The estimates of the global cost of gender inequality in earnings are based on current conditions, since they rely on estimations of expected future earnings of today's labor force, with expected earnings measured based on existing household surveys and therefore current conditions. As such, the estimates do not account for potential future shifts, whether those are related to demographic change, the changing nature of work, technological advances, or the potential impact of fragility and conflict among others. For example, men and women are expected to be affected in similar proportions by automation (McKinsey Global Institute, 2019). However, if men are over-represented in emerging technology-related fields with high levels of pay and future opportunities, it could be that gender inequality in earnings may worsen in the future in some countries due to technological change (on how to promote digital jobs for women, see Solutions for Youth Employment, 2018). As another example, although the issue of the potential impact of gender inequality on population growth is considered in this study, the role that population growth will play for human capital wealth through the size of the labor force is not fully taken into account since estimates only consider individuals older than 15. Considering the potential impact of future shifts in the labor market on estimates of gender inequality in earnings is beyond the scope of this study, but those issues could be considered in follow up work.

BOX 5: LIMITATIONS OF THE METHOD USED TO COMPUTE LOSSES IN HUMAN CAPITAL WEALTH

The estimation of the losses in human capital wealth due to gender inequality simply assumes that women could work and earn as much as men. While this approach has the merit of being simple and transparent, it does not consider potential effects on men of rising earnings and hours worked for women. We do not account for the fact that men's earnings may decrease if women become better educated and have access to the same employment opportunities as men (for example, resulting from reductions in occupational segregation). We also assume that women can allocate more time to labor market work without a negative impact on men's working hours, therefore not considering the possibility of men having to allocate more time to unpaid domestic work or care. Women tend to do most of the domestic work, especially in developing countries. As women work more hours in paid employment, they may have less time for unpaid domestic work, which could affect the number of hours that men may be able to spend in paid employment, depending on options for elderly, child, or other care services available to households. Many other effects could be at work as women catch up with men in earnings. Here, for simplicity, we only compute how much more human capital countries would gain if women had the same lifetime earnings profile as men without any decrease in men's earnings.

In that sense, estimates could be considered an upper bound of the losses from gender inequality in earnings since we do not factor in the potential general equilibrium impact of higher work and earnings for women on men or the labor market more generally. There is evidence that over time, labor market premiums associated with higher levels of educational attainment may be reduced once more workers have those higher levels of education. Angrist (1995) showed that the expansion of access to education in the Palestinian territories led to a reduction in the skills premium. Acemoglu et al. (2004) note that during World War II, higher labor force participation by women depressed wages for low skilled workers. Duflo (2004) suggests similar effects in Indonesia after a large school construction program. If women were to become better educated and if they were to participate more in the labor market, including in sectors traditionally dominated by men, this could reduce expected earnings for men. These are just a few examples of studies suggesting that general equilibrium effects may be large as noted by Acemoglu (2010) (for a recent study on engineers, see Qvist et al., 2016).

However, the estimation could also be a lower bound of losses. Indeed, higher earnings for women could lead to more economic activity overall, with positive multiplier effects on the economy and thereby on wages. Furthermore, if systems for the provision of care to family members were expanded, a substantial share of the time now allocated to unpaid care could become paid care work. The literature also suggests that as countries develop and women join the labor market or work longer hours, this may primarily reduce leisure and time spent on domestic chores. Overall, especially through economy-wide multiplier effects, unleashing women's earnings potential could generate in the medium to long run larger earnings and human capital gains for both men and women than suggested here. We also do not account for intergenerational labor market benefits from unleashing women's earnings through better education, health, and employment opportunities. The effects for the children of women could be large too, and are not measured here, except in the specific case of reductions in under-five mortality and stunting rates in the section on health costs and benefits.

Table 2: Human Capital Wealth by Gender and Potential Loss Due to Gender Inequality (US$ of 2014)

	1995	2000	2005	2010	2014	2017(*)
Human capital wealth per capita, men	56,290	60,940	60,980	62,672	66,832	68,717
Human capital wealth per capita, women	32,584	35,538	36,727	39,498	41,823	42,852
Ratio of women versus men's human capital	58%	58%	60%	63%	63%	62%
Loss as share of baseline human capital	25.9%	25.5%	24.0%	21.6%	21.7%	17.9%
Loss as share of baseline total wealth	17.9%	17.8%	16.0%	13.9%	14.0%	NA
Loss in human capital wealth per capita	23,030	24,603	23,391	22,068	23,620	24,586

Source: Wodon (2018); see also Wodon and de la Brière (2018).
Note: The loss in human capital wealth per capita is not exactly equal to the difference between human capital wealth per capita estimates for men and women due to differences in the number of men and women. Estimates for 2017 are projections. The loss as share of baseline total wealth is not provided since total wealth is not projected for 2017.

Estimates of potential losses in human capital wealth per capita due to gender inequality are provided in Table 3 by region and income groups. The largest loss in per capita terms by far is observed for North America, followed by Europe and Central Asia and East Asia and the Pacific. This is because many of the countries in these regions are high income or upper middle income, and thereby they concentrate much of the world's human capital wealth. But the losses in other regions are substantial too, especially in comparison to current levels of human capital wealth and development. For example, in South Asia, the potential losses from gender inequality are estimated at US$5,405 per capita in 2014, while in sub-Saharan Africa, the estimate is US$2,914 per capita. This is the smallest estimate across regions. However, as a share of initial wealth, the potential losses from gender inequality in sub-Saharan Africa are actually larger than the loss in Latin America and the Caribbean and especially the Middle East and North Africa in part because of high levels of natural capital from sub-soil assets (especially oil) in that region. The potential loss in wealth per capita from the base associated with gender inequality is highest in South Asia, the region with the lowest initial share of women in human capital. Estimates for 2017 are typically slightly higher than for 2014 due to growth in real terms in GDP per capita and resulting labor earnings.

Losses from gender inequality also differ between countries ranked by income groups, defined according to the World Bank classification (low income, lower middle income, upper middle income, and high income). Among high income countries, a differentiation can be made between OECD and other high-income countries, the latter group including several oil-producing countries from the Middle East. In absolute terms, the largest potential losses are observed for

Table 3: Potential Loss in Human Capital Wealth Per Capita from Gender Inequality by Region and Income Groups (US$ of 2014)

	1995	2000	2005	2010	2014	2017(*)
	Regions					
East Asia & Pacific	18,627	18,450	18,663	20,130	23,253	25,367
Europe & Central Asia	39,892	44,511	45,045	46,261	48,884	51,377
Latin America & Caribbean	15,500	11,558	11,945	11,468	10,940	10,545
Middle East & North Africa	9,275	11,261	11,220	11,150	11,757	11,491
North America	146,791	175,923	156,600	126,052	133,299	139,162
South Asia	2,664	3,383	4,374	4,613	5,405	6,394
Sub-Saharan Africa	2,016	1,927	1,435	2,480	2,914	2,906
	Income Groups					
Low income countries	1,335	1,406	1,415	1,675	2,052	2,202
Lower-middle income countries	3,407	3,472	3,958	4,275	4,967	5,653
Upper-middle income countries	6,032	5,764	7,872	9,800	12,067	13,669
High income non-OECD	10,637	14,047	14,378	17,021	18,672	18,627
High income OECD	108,593	121,735	112,859	102,567	108,631	113,674

Source: Wodon (2018); see also Wodon and de la Brière (2018).
Note: Estimates for 2017 are projections.

high income OECD countries and upper-middle income countries (which include China). Absolute losses in human capital wealth per capita from gender inequality are much higher in high income than in low income countries simply because the levels of wealth on which losses are applied are higher in high income countries. But again, in percentage terms from the base, the picture is different. In 2014, low income countries are losing 15.1 percent of their base level of wealth (including all types of capital) with gender inequality in earnings, which is slightly larger than the increase for the world, at 14.0 percent in 2014. Note also that losses from gender inequality are lower in proportional terms from the base in high-income non-OECD countries, in part because many of these countries have oil and thereby higher levels of natural capital.

How do these results compare to previous studies? Comparisons can be made with previous work for both the estimates of (i) gender shares in earnings which are key for the estimation of the losses from gender inequality; and (ii) the aggregate magnitude of the losses associated with gender inequality. Comparisons in terms of the aggregate magnitude of losses will be done in a subsequent section of this note when presenting aggregate estimates. As to gender shares, previous studies have focused on gender shares in GDP, while we estimate gender shares in human capital wealth. This difference in focus could lead in differences in estimates. However, given that both approaches are based on earnings data, they should generate somewhat similar gender shares. This turns out to be the case. The gender shares of GDP reported by the McKinsey Global Institute (2015) are broadly similar to ours[1]. The same conclusion is reached when comparing globally our estimates of women's share of human capital wealth to estimates of women's contribution to GDP from the World Economic Forum's Gender Gap Report (2020).Broadly, there is relatively good alignment, at least at the global and regional levels, suggesting some robustness in the estimates (analysis of factors contributing to gender gaps in pay is also available in International Labor Office, 2019)[2].

SELECTED FACTORS LEADING TO GENDER GAPS IN EARNINGS

Two broad factors lead women to have lower lifetime earnings than men. First, women have lower labor force participation rates and work in paid employment for fewer hours than men. Second, women tend to be paid less when they work compared to men. This is driven in part by lower levels of educational attainment and occupational segregation (Das et al. 2019). Differences between men and women in the returns to education and experience may also play a role. These factors may keep women in productivity traps confounded by social norms relegating them to unpaid care and informal work. This leads to gender inequality in labor income. While documenting in detail the role of these various factors is beyond the scope of this note, pointers on differences in both labor force participation and the returns to education for women and men are worth providing.

Consider first data on labor force participation. Such data are available for men and women from various data sources. Two such sources are used in this section: the Gallup World Poll and the GLD database (see Appendix 1 on data sources). While the Gallup World Poll is not a primary source of data for analysis of labor markets, it is useful to complement the GLD database and show that findings with both databases are similar. With both data sources, we can look at the potential impact of gender on an individual's employment status, either through statistical comparisons or through regression analysis controlling for other factors that may affect labor force participation. Table 4 provide the estimates, with visualization in Figure 2 for the Gallup World Poll. The first column of data in the Table provides the share of men in the labor force, as well as a decomposition of that share into various groups. For the Gallup World Poll, the categories are working full-time or part-time, or being unemployed. For the GLD database, the categories are the shares working more than 30 hours or less than 30 hours and the share of those being unemployed. The next column provides the estimates for women.

[1] Our estimate of women's share of human capital wealth is 38 percent globally in 2014, and McKinsey's estimate of women's contribution to GDP is 37 percent. Gender shares are broadly similar at the regional level as well. For East Asia and the Pacific, women's share of human capital wealth is 35 percent, while McKinsey reports women's contributions to GDP of 41 percent for China and 34 percent for the rest of the region. In Europe and Central Asia, women's share of human capital is at 39 percent in this study, versus 38 percent for their share in GDP in Western Europe and 41 percent for Eastern and Central Europe in the McKinsey study. In Latin America and the Caribbean, our share for women is at 44 percent versus 33 percent for McKinsey. In the Middle East and North Africa, we are at 27 percent versus 18 percent for McKinsey. The shares for North America are virtually the same at 41 percent and 40 percent. In South Asia, our share is at 19 percent versus 17 percent for India and 24 percent for other countries in the McKinsey study. Finally, for sub-Saharan Africa, we have the same share for women at 39 percent.

[2] As to whether one set of approaches is better than another at the country level to estimate women's shares of GDP or human capital wealth, this is a question that needs to be investigated further. The results may vary from one country to another depending on the quality of the underlying data. But for broad aggregates as reported here, the underlying shares are fairly similar.

Findings are similar with both databases. The differences between men and women are large, with men much more likely to be in the labor force than women – a well-established fact. Furthermore, among those in the labor force, the share working part time or less than 30 hours is higher for women than for men. Unemployment rates are similar. For this report as well as for a separate study on the cost of not educating girls (Wodon et al., 2018), the Gallup Poll was also used for a series of indicators –for no other indicator were differences between men and women as large as those observed for labor force status.

Clearly, differences in labor force participation as well as between working full time or part time are a leading factor affecting differences in human capital wealth by gender. When conducting regression analysis for the likelihood of being in the labor force, working full-time (or more than 30 hours in the GLD database), working part-time (or less than 30 hours), or being unemployed, the impact of the sex variable in the regressions accounts for most of the difference between men and women (in comparison to the impacts of differences between men and women in other independent variables). This can be seen in the last column of the Table that provides the impact at the margin of being a woman on labor force status. For example, in the Gallup World Poll, after controlling for other observable characteristics that may affect labor force participation, being a woman is associated with a drop in the likelihood of being in the labor force of 21.4 percent, which is close to the absolute gap in labor force participation between men and women at 25.8 percent. The corresponding value for the marginal impact in the regression analysis with the GLD database is 19.7 percentage points. The same holds for the likelihood of working full time. Gender effects are thus clearly at work in decisions to work and how much to work, even after controlling for other individual characteristics such as educational attainment.

A different story emerges when looking at whether gender gaps in earnings and human capital wealth are affected substantially by differences in the returns to education for men and women. There is a large literature on the potential impact of educational attainment on earnings (see Psacharopoulos and Patrinos, 2018, for a recent review). The benefits from educational attainment are typically measured through regression analysis whereby the potential effect on earnings of educational attainment and potential experience (measured as age minus six and the number of years of schooling) is estimated. In some models, the focus is the correlation between years of schooling and earnings, and the implicit gain associated with each additional year of schooling. Other models look at the potential impact on earnings of different levels of schooling, such as having a primary, secondary, or tertiary education. Apart from educational attainment, whether measured through years of schooling or in levels, the models may also control for other variables that may affect earnings.

For this study, building on Wodon et al. (2018), Montenegro and Wodon (2020) estimate the potential impact of

Table 4: Differences in Labor Force Participation and Type of Work by Gender, Global Estimates (%)

	Share for Men	Share for Women	Difference in Shares (Women Minus Men)	Regrssion Estimate
Gallup World Poll				
Share in the labor force	75.3%	49.5%	-25.8%	-0.21
Share working full-time	57.2%	31.2%	-26.0%	-0.22
Share working part-time	13.2%	13.4%	0.2%	NS
Share unemployed (looking for work)	4.9%	5.0%	-0.0%	0.00
GLD Surveys				
Share in the labor force	77.3%	57.6%	19.7%	-0.18
Share working more than 30 hours	61.1%	38.8%	22.3%	-0.11
Share working less than 30 hours	9.1%	12.3%	-3.2%	0.11
Share unemployed (looking for work)	7.1%	6.5%	0.6%	0.02

Source: Authors. Regression analysis based on data from the Gallup World Poll and the GLD database. The regression estimate is the coefficient for the gender dummy variable controlling for other factors affecting employment status.

Note: Regression estimates reported for the pooled sample that includes data for more than 100 countries with each of the two data sources. NS means that an estimate is not statistically significant at the 10 percent level.

educational attainment on earnings using a large database of household and labor surveys available at the World Bank (see Appendix 1). Models with years of education as well as educational attainment in levels are considered, but we report below the results from models with levels of education only because this enables us to assess the difference that the quality of the education received makes. As a proxy for quality, the authors distinguish for individuals with a primary education or less whether the individuals declare being literate or not. When educational attainment is measured in levels, all individuals with some primary education or primary education completed but no education at a higher level are combined in a single category for primary education, although with differentiation depending on whether they declare being literate or not. The same is done for secondary and tertiary education, but in this case no distinction is made between individuals declaring being literate or not because virtually all individuals at those levels declare being literate. In other words, while the authors do not distinguish whether individuals have completed or not a specific cycle of study due to data limitations and the fact that the analysis is conducted for a large number of countries, they factor in an implicit measure of quality using literacy as a proxy.

To test for differences in the returns to education by gender, the authors estimate models separately for men and women. They also estimate models with and without additional controls apart from educational attainment and experience. The additional controls considered are location (urban versus rural) and sector of activity (agriculture, industry, services, and others). These additional controls are limited due to the need to keep comparability across countries. It is worth noting that when controls for occupation are used, they may partially net out employment segregation from the measure of the gender gap in the returns to schooling.

Table 5 provides the main results for the models without additional controls apart from educational attainment and experience and its squared value. Average results across countries and surveys are reported first for all surveys, and next for a sample with only the latest survey available for each country. Average gains from educational attainment are computed treating all countries equally. In other words, a small country has the same weight as a large one, and poor and rich countries are also treated equally. Several interesting findings emerge from the analysis.

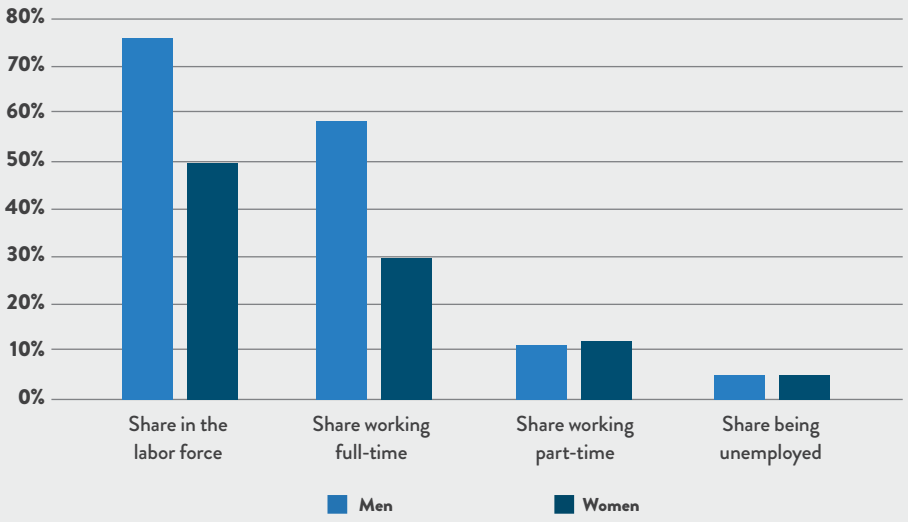
First, as expected, the gains in earnings associated with higher educational attainment are substantial, especially at the secondary and tertiary levels, while they are much lower at the primary level. For example, for women with primary education (partial or completed) who are literate, the average expected gain in earnings versus no education and no literacy (the reference category) is 39.8 percent. By contrast, for women with secondary education, the average gain compared to no schooling and no literacy is much larger at 129.1 percent. Finally, for women with tertiary education, the average gain is at 386.7 percent. Clearly, women with higher educational attainment (and literacy in the case of primary education) earn more than those with no education

and no literacy, but the gains start to be much larger at the secondary and tertiary levels. This is an important finding given that gaps in educational attainment between men and women are larger, at least in low income countries, at the secondary level. This also means that for women who do not have secondary education, the benefits from the limited education they have at the primary level are potentially much smaller.

Second, the marginal gains by level of education are typically larger for women than men. The potential beneficial impacts of more years of education are thus slightly higher for women than men. This may be in part because the point of comparison – women with no education at all – have low earnings, so gains in percentage terms are computed from a low base. Still, this suggests that differences in earnings and human capital between men and women are probably not due to any large extent to differences in the returns to education, but rather to differences in labor force participation and the type of job held, as well as differences in educational attainment. While globally girls have caught up with boys in educational attainment at the primary and lower secondary levels, this is not the case everywhere, and especially not in a large number of sub-Saharan African countries where child marriage affects adolescent girls disproportionately, resulting in lower completion rates for girls at the lower and especially upper secondary level according to data from Demographic and Health Surveys. In addition, in the adult population, women still lag behind men in terms of years of education due to the legacy of the past. Note that if the level of earnings for women is lower than for men across all education levels, this is not inconsistent with equal returns to education, or even returns for women being higher than for men.

Third, quality matters, as proxied by whether individuals declare being literate or not. When individuals have a primary education but are not literate, the gains are virtually non-existent versus having no education at all. When individuals have a primary education and are literate, the gains are larger, and when individuals are literate but do not have a primary education, the gains are almost as large as when they have a primary education and are literate. In other words, going to primary school without learning does not generate gains, which helps to emphasize the need for learning apart from schooling (as advocated in World Bank, 2018b).

Figure 2: Differences in Labor Force Participation and Length of Work by Gender, Gallup World Poll (%)



Source: Authors.

Table 5: Potential Impact of Educational Attainment on Earnings for Women and Men (Percentage Gains, %)

	Full Sample		Last Year per Country	
	Men	**Women**	**Men**	**Women**
No education and illiterate	Ref.	Ref.	Ref.	Ref.
No education and literate	21.9	30.3	15.8	37.4
Primary education and illiterate	3.6	7.8	6.7	-2.8
Primary education and literate	35.1	39.8	23.6	33.6
Secondary education	101.9	129.1	75.8	108.4
Tertiary education	301.7	386.7	233.2	350.0

Source: Montenegro and Wodon (2020). Regression analysis based on wage earnings data from the World Bank's GLD database.
Note: Reported estimates based on the average value of regression coefficients across counties. The exponential transformation (given that the dependent variable is the logarithm of earnings) is taken for the average coefficient.

BOX 6: GENDER INEQUALITY, POVERTY, AND EDUCATION

Gender inequality contributes to monetary poverty, a measure of the inadequacy of income to meet basic needs, in several ways. The most important pathways for this impact are related to (1) lower labor earnings for women and their household; and (2) higher dependency ratio and household needs through high fertility. Higher educational attainment for women from gender equality in low income countries not only increases labor income but also results in lower fertility. This study does not provide measures of the potential impact of gender inequality on monetary poverty. These potential effects are likely to be large however, as witnessed in the case of educational attainment by UNESCO (2017). Using data from the Gallup World Poll, Wodon et al. (2018) estimate the potential impact of the level of women's educational attainment on two types of perceptions: the perceptions of their own standard of living and the perceptions of whether economic conditions are improving or favorable. For example, when women have a secondary education level, they are seven percentage points more likely to state that they have enough money to buy food in comparison to women who have only a primary education or less. With tertiary education, the potential effect for the perceived ability to satisfy food needs is a gain at the margin of 12 percentage points in comparison to a primary education or less. It should be emphasized that individuals with higher levels of educational attainment may have on average higher expectations for their own standards of living. This implies that if the potential impacts of educational attainment on objective standards of living had been measured, impacts would probably have been larger.

DOMAIN 2: CHILD MARRIAGE, EARLY CHILDBEARING, AND EDUCATIONAL ATTAINMENT

CHILD MARRIAGE

Child marriage, defined as entering into a union (whether formal or informal) before the age of 18, is a clear manifestation of gender inequality. The practice affects mostly girls and has large negative impacts on a wide range of development outcomes (Wodon et al., 2017). It also leads in many cases to early childbearing, defined as a girl having a first child before the age of 18 (for estimates, see Wodon et al., forthcoming; on the impact of child marriage on reproductive health, see for example Kamal, 2012, and Onagoruwa and Wodon, 2018a; for a broader review of the negative impacts of child marriage, see Parsons et al., 2015). In simulations of the impact of gender inequality on a range of development outcomes such as fertility, under-five mortality and stunting, and women's decision-making, achieving gender equality will be assumed to include ending child marriage or early childbearing, depending on the indicator being looked at. This also means that no analysis of the correlates of child marriage and early childbearing is required for estimating costs, since the assumption is that achieving gender equality would end child marriage and early childbearing. The focus in this sub-section is on describing trends in child marriage, while the next sub-section documents the relationship between child marriage and early childbearing.

Table 6 and Figure 3 provide global and regional trends in child marriage from 1990 to 2017. Progress is in the right direction, but slow (Nguyen and Wodon, 2015; Le Nestour et al., 2018). The prevalence of child marriage decreased from 24.8 percent in 2000 to 19.1 percent in 2017. The decrease in India accounts for a substantial share of the global decrease. Prior to 2010, South Asia had the highest prevalence of child marriage. Today, sub-Saharan Africa has the highest prevalence at 35.1 percent with limited progress over time. There is a clear association between country income levels and the prevalence of child marriage, with much higher child marriage rates in poorer countries. At the same time, there are large differences between countries within income groups, pointing to the role of social norms and policies in influencing child marriage.

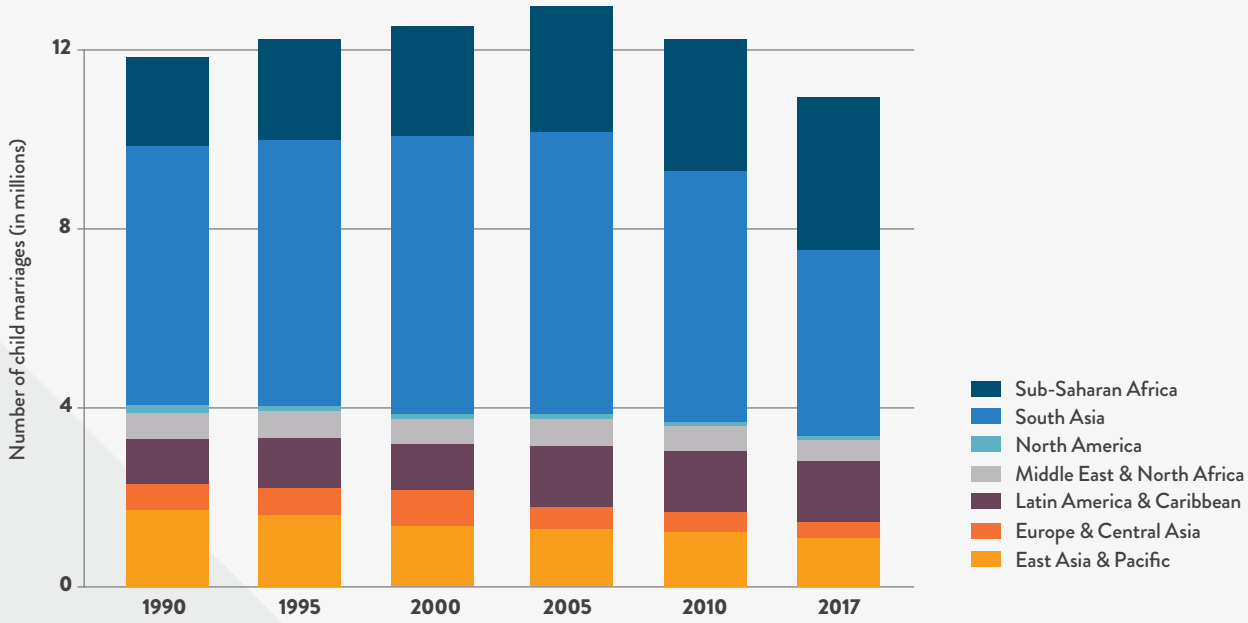
The number of girls marrying as children peaked globally at about 13.0 million around 2005. Due to progress in India and other countries, it declined to 10.9 million in 2017. Because of its population size, South Asia still has the largest number of child marriages (4.1 million in 2017), but sub-Saharan Africa is not far behind with 3.4 million girls marrying as children each year. While the number of girls marrying as children has declined over the last decade in South Asia, it is still increasing in sub-Saharan Africa.

Table 6: Trend in the Prevalence of Child Marriage for Girls by Region and Income Group (%)

	1995	2000	2005	2010	2014	2017
Regions						
East Asia & Pacific	9.4	8.9	8.6	7.8	6.5	7.5
Europe & Central Asia	9.4	9.3	9.0	7.3	6.4	5.6
Latin America & Caribbean	23.7	26.3	26.7	27.1	26.2	25.8
Middle East & North Africa	26.6	21.7	17.8	15.7	14.6	13.4
North America	7.2	6.2	6.6	6.2	3.7	2.2
South Asia	58.9	54.7	50.8	46.0	38.0	27.0
Sub-Saharan Africa	44.2	41.6	39.5	39.1	36.8	35.1
Total	24.9	24.7	24.8	23.6	20.5	19.1
Income Groups						
Low income	31.5	31.2	42.9	42.0	41.0	37.4
Lower middle income	20.2	20.6	9.8	13.2	29.5	24.2
Upper middle income	18.2	21.7	19.2	12.8	9.9	11.9
High income	4.4	3.4	3.7	3.6	2.6	2.1
Total	24.9	24.7	24.8	23.6	20.5	19.1

Source: Le Nestour et al. (2018).
Note: Income group classification based on World Bank thresholds.

Figure 3: Trends in the Number of Child Marriages Globally and by Region



Source: Le Nestour et al. (2020).

Especially in countries where the prevalence of child marriage is high, parents often have their daughter marry early when they are not in school because of a concern that she may otherwise engage in sexual activity. In many contexts, a pregnancy outside of marriage may lead to ostracism for the girl, thereby fundamentally affecting her prospects in life. For many parents, the decision to marry their daughter is taken to protect her. For girls themselves, when education and employment opportunities are limited, staying at home may not be a good option. As will be discussed later, keeping girls in school is key to end child marriage, but this does not mean that other types of interventions and policies – such as setting the minimal legal age for marriage at 18, are not needed. Child marriage is a deeply rooted social norm (Gemignani and Wodon, 2015). The practice needs to be addressed through multifaceted interventions.

Before shifting to the discussion of early childbearing, it is worth noting that while child marriage is commonly seen as a form of violence against girls, it is not the only such form of violence. The gender equality goal under the SDGs also mentions female genital mutilation (FGM) as a harmful practice. This study does not provide estimates of the economic costs of female genital mutilation as a form of gender inequality, but such costs could be large for the women who suffered from FGM (Refaei et al., 2016). Many of the deep-seated social norms that lead to the perpetuation of child marriage also contribute to the perpetuation of FGM from one generation to the next, which implies that some of the policies that could help end child marriage could also be beneficial for reducing FGM (Wodon et al., 2017; see also Box 7 on the correlates of the transmission of FGM across generations). While this study does not provide estimates of the economic costs related to FGM, past work by Taghreed et al. (2008) suggests that the costs, while substantial, are likely to be of a lower order of magnitude than costs related to other impacts of gender inequality documented in this study (for another study on the United Kingdom, see Hex et al. 2016).

EARLY CHILDBEARING

Early childbearing comes with steep impacts to development outcomes, not least are the risk to young mothers from these pregnancies and a higher likelihood of under-five mortality and stunting for their children. For some girls, having one or more children before the age of 18 may be the consequence of child marriage. For others, marriage may result from an early childbirth or pregnancy. For yet others, early childbirths may not be related to child marriage at all. In developed countries, the share of early childbearing or teenage pregnancies that are due to child marriage are likely to be low. In the United States, estimates suggest that 750,000 teenage girls become pregnant every year and four in five such pregnancies are not wanted. But in developing countries, many instances of early childbearing are due to child marriage. The share of instances of early childbearing likely due to child marriage is estimated for 25 developing countries using DHS data (see box 8 for technical details).

BOX 7: TRANSITION OF FEMALE GENITAL MUTILATION FROM ONE GENERATION TO THE NEXT

Female genital mutilation (FGM) continues to affect millions of girls each year. The practice remains common in many countries and can have severe health consequences for girls and their future children. It is also related to deep-seated patterns of gender inequality and gender-based violence. Several factors explain the transmission of the practice from one generation to the next (Onagoruwa and Wodon, 2018b).

Community pressure and social norms. Where FGM is a social convention or norm, the social pressure to conform to what others in the community are doing or have been doing, as well as the need to be accepted socially and the fear of being rejected by the community, are strong motivations to perpetuate the practice. The role of perceptions related to sexuality is also prominent in the perpetuation of the practice. FGM has been described as a mechanism to "manage" women's sexuality, among others to ensure that a girl remains pure and is not tempted to be promiscuous. Community prevalence of FGM has a large effect on individual practice. Thus, there is a key role of local structures of power and authority, including community leaders, religious leaders, circumcisers, and even some medical personnel in perpetuating or helping stop the practice.

Mothers' own past experiences. The risk of cutting for daughters increases by 18 to 40 percentage points if the mother was herself cut. If a mother was married as a child, this also increases the likelihood that her daughter will be cut. In addition to the role that mothers play in the perpetuation of the practice, the mother in law and grandmothers of girls at risk of being circumcised also play a role.

Educational attainment. There is a reduction in the risk for daughters to be cut if the mother has at least a secondary education. In the case of support for the continuation of the practice, a secondary or higher level of education for the mother is associated with a reduction in support. Educational attainment for the husband or partner at the secondary level or higher is also associated with a reduction in the risk of cutting for daughters. Better educated fathers are also associated with a reduction in support on the part of mothers and women in general for the practice. This points to the important role that men can play in ending the practice.

Wealth and poverty. The risk of daughters being cut and the likelihood for women to support the practice is higher among poorer households. Through impacts on expected earnings and wealth, women's education especially at the secondary level could again help reduce FGM.

Estimates in Table 7 suggest that at the level of mothers, across the developing countries for which estimates were obtained and without population weights (so that all 25 countries are weighted equally), three in four cases of early childbearing (75.2 percent) are due to child marriage on average. In addition, 84.4 percent of children born of mothers younger than 18 are attributed to child marriage. Ending child marriage should therefore have a major impact on reducing early childbirths. This impact would however differ between countries since especially in Latin America and parts of sub-Saharan Africa, there is a trend towards earlier sexual activity along with an increase in the average age at first marriage, suggesting less of a direct connection between marriage and sexual activity and early childbearing in some countries than others. One implication is that while in some countries preventing child marriage could drastically reduce early childbearing, in other countries other interventions and policies may be needed to delay sexual debut among girls while also providing access to modern contraception and ensuring that adolescent girls benefit from programs increasing their sexual and reproductive health knowledge. Experiences suggest that such programs implemented in school can have positive effects.

Table 7: Share of Early Childbearing and Early Childbirths Likely Due to Child Marriage (%)

	Average share (25 countries)
Share of early childbearing likely due to child marriage (for mothers)	75.2
Share of early childbirths likely due to child marriage (for children)	84.4

Source: Wodon et al. (forthcoming).
Note: Estimates are based on country-level analysis for 25 developing countries.

BOX 8: MEASURING THE SHARE OF EARLY CHILDBIRTHS DUE TO CHILD MARRIAGE

To measure the share of early childbirths likely to be due to child marriage (Wodon et al., forthcoming), an upper bound for the share of early childbirths for mothers likely due to child marriage can be defined as one minus the share of mothers who had their first child before the age of 18 but did not marry before 18. A lower bound can be defined by subtracting from the upper bound the share of women who did marry before the age of 18, but had their first child less than nine months after their first marriage, which could suggest that marriage was not the cause of the early childbirth. An intermediate estimate could use a threshold of six months instead of nine months for the comparison of the timing of the first birth and first marriage. Indeed, if a girl/woman does not know for sure that she is pregnant, the pregnancy may not affect the decision to marry. In addition, in some countries, even in traditional contexts, cohabitation and sexual activity is permitted before a formal marriage as long as the marriage has been agreed to. The same approach and definitions can be used when looking at the share of early childbirths as defined at the level of children as opposed to mothers. While this approach has the benefit of being simple, it remains tentative and additional work would be useful to triangulate the results with a more detailed framework, for example based on Bongaarts' model.

EDUCATIONAL ATTAINMENT

Substantial progress towards gender equality has been achieved in educational attainment over the last two decades. According to data from the World Bank's World Development Indicators, nine in ten girls (89.3 percent) complete their primary education globally, and three in four (70.6 percent) complete their lower secondary education. For boys, the proportions are very similar at 89.9 percent and 75.3 percent. In other words, girls have caught up with boys in educational attainment globally. However, in low income countries, substantial gender gaps in educational attainment persist, especially at the secondary level where the completion rate for girls at 36.9 percent is below that of boys. Gender inequality emerges more strongly in adolescence. Globally, girls were at a substantial disadvantage just under 25 years ago, but have caught up and have a minor advantage versus boys in completion rates at lower secondary (Table 8). This is the case in all regions except sub-Saharan Africa, and all income groups except low income countries. In sub-Saharan Africa and low income countries, while girls have been catching up, large gaps still exist.

Table 8: Completion Rates for Lower Secondary Education, Boys and Girls, 1995-2018 (%)

	1995	2000	2005	2010	2015	2018
			Boys			
Regions						
East Asia & Pacific	65.8	77.7	86.7	89.2	84.4	84.2
Europe & Central Asia	80.6	84.4	88.5	91.8	93.3	93.1
Latin America & Caribbean	61.9	67.3	72.4	75.1	76.9	78.1
Middle East & North Africa	62.5	65.2	71.3	70.4	74.9	75.0
North America						98.1
South Asia	54.5	55.7	59.5	68.0	76.9	78.1
Income Groups						
Low income	25.3	26.7	32.7	40.2	43.8	44.0
Lower middle income	53.5	56.0	60.9	67.7	74.0	74.3
Upper middle income	68.4	78.8	86.9	88.1	83.3	83.5
Middle income	60.4	66.6	72.9	76.1	77.6	77.8
High income	83.7	85.8	89.4	91.9	94.2	94.3
World	60.6	65.6	71.2	74.1	75.4	75.3
			Girls			
Regions						
East Asia & Pacific	59.3	74.0	86.0	91.5	87.4	86.7
Europe & Central Asia	82.2	85.7	88.1	91.9	93.9	94.0
Latin America & Caribbean	66.6	72.0	77.9	80.9	82.1	83.3
Latin America & Caribbean	54.0	61.3	68.4	70.3	75.3	76.3
North America						94.3
South Asia	37.9	43.1	52.0	65.2	80.6	81.7
Sub-Saharan Africa	22.7	24.4	29.7	36.7	40.4	41.6
Income Groups						
Low income	16.2	17.7	22.8	31.3	36.3	36.9
Lower middle income	41.5	47.5	56.0	66.1	76.7	77.3
Upper middle income	64.9	77.1	86.8	90.4	85.4	85.2
Middle income	52.4	61.4	70.3	76.1	80.1	80.3
High income	83.9	86.2	89.3	91.6	94.1	94.2
World	53.5	60.6	68.1	72.9	76.1	76.0

Source: Compiled by the authors from the World Bank's World Development Indicators.
Note: Data are not provided for North America.

While in many regions girls have caught up with boys in educational attainment, for the adult population, and even for girls aged 15 to 24, gaps in educational attainment remain, with implications for literacy, especially again in low income countries. As shown in Table 9, women continue to lag behind men in literacy, with serious implications for their earnings potential in adulthood, as mentioned previously when discussing gender gaps in earnings and the returns to education and literacy. In addition, other important gender gaps remain. One issue that has drawn attention in the literature is the persistent gap in post-primary student performance (and related choices of study tracks at the secondary level) in mathematics and selected sciences, with girls doing on average worse than boys. Since these gaps are strong predictors of later academic choices (including in terms of studying STEM vs non-STEM subjects at the tertiary level, as noted by Chachashvili et al., 2016) as well as labor market outcomes, they have implications for gender gap in earnings. Potential drivers of these gaps include family background and social norms, teacher focus and support that may differ between genders, and institutional features reinforcing those outcomes. While most of the existing research focuses on developed countries, similar or even wider gaps may be observed in developing countries (e.g., Herz and Sperling, 2014). This is one of the areas where further research could shed light on appropriate policies.

Table 9: Adult Literacy Rates by Gender, Individuals Age 15-24, 2000-2018 (%)

	2000	2010	2018
		Men Ages 15-24	
Regions			
East Asia & Pacific	98.1	98.7	98.7
Europe & Central Asia	99.3	99.6	99.7
Latin America & Caribbean	94.6	97.0	98.4
Middle East & North Africa	90.4	91.9	92.0
South Asia	80.2	86.7	91.1
Sub-Saharan Africa	72.9	75.4	79.5
Income Groups			
Low income	67.5	74.1	78.8
Lower middle income	84.6	88.4	91.3
Upper middle income	97.8	98.3	98.3
Middle income	90.7	92.9	94.1
World	89.8	91.8	92.9
		Women Ages 15-24	
Regions			
East Asia & Pacific	86.3	92.0	93.9
Europe & Central Asia	95.4	96.8	97.9
Latin America & Caribbean	88.2	91.1	93.4
Middle East & North Africa	59.1	68.8	72.3
South Asia	44.9	55.7	63.7
Sub-Saharan Africa	47.4	51.0	58.8
Income Groups			
Low income	43.3	47.5	55.6
Lower middle income	57.2	65.2	70.9
Upper middle income	87.0	92.0	93.7
Middle income	73.2	79.1	82.4
World	75.4	79.9	82.8

Source: Compiled by the authors from the World Bank's World Development Indicators.
Note: estimates for North America and high income countries are not available from the database.

There are strong mutual relationships between girls' education, child marriage, and early childbearing. Pregnancy often results in school drop out in low income countries, due to implicit or explicit policies prohibiting pregnant girls to attend and child marriage is almost always incompatible with staying in school (Figure 4). Whether marriage drives girls out of school or girls leave for other reasons and then get married is difficult to differentiate (Box 9), but studies suggest that child marriage has a negative impact on educational attainment (e.g., Field and Ambrus, 2008; Nguyen and Wodon, 2014) and that keeping girls in secondary school is one of the best strategies to reduce child marriage and early childbearing (Botea et al., 2017). Each additional year a girl completes in secondary school is estimated to reduce the likelihood of marrying as a child on average by 6.1 percentage points across 15 countries and the risk of having a first child before age 18 by 5.8 percentage points (Wodon et al 2018). With several years of education, the reductions in risks of child marriage and early childbearing are even larger.

BOX 9: WHY DO GIRLS DROP OUT OF SCHOOL IN SUB-SAHARAN AFRICA? THE CASE OF NIGER

When parents are asked why their daughters dropped out of school, the cost of schooling, early marriages and pregnancies, a lack of learning while in school, and a lack of interest in remaining in school often come up. This also emerges from ethnographic work. Such work in Niger suggests six main obstacles to girls pursuing post-primary education (Perlman et al., 2018a, 2018b).

1. *Poor learning outcomes and cost.* Rural government schools are so poor in quality and resources that many children graduate from primary school without learning to read. The schools do not charge tuition, but parents complain that the cost of uniforms, transport, lunches and the opportunity costs of losing their daughters' labor are hardly worth the poor learning outcomes they see.

2. *Failure at examinations.* Until recently, students could only take the primary school completion exam twice. If they failed, they were ineligible to continue in public education. When girls failed examinations, parents say that they have little choice but to begin looking for a suitable suitor whom their daughter could marry.

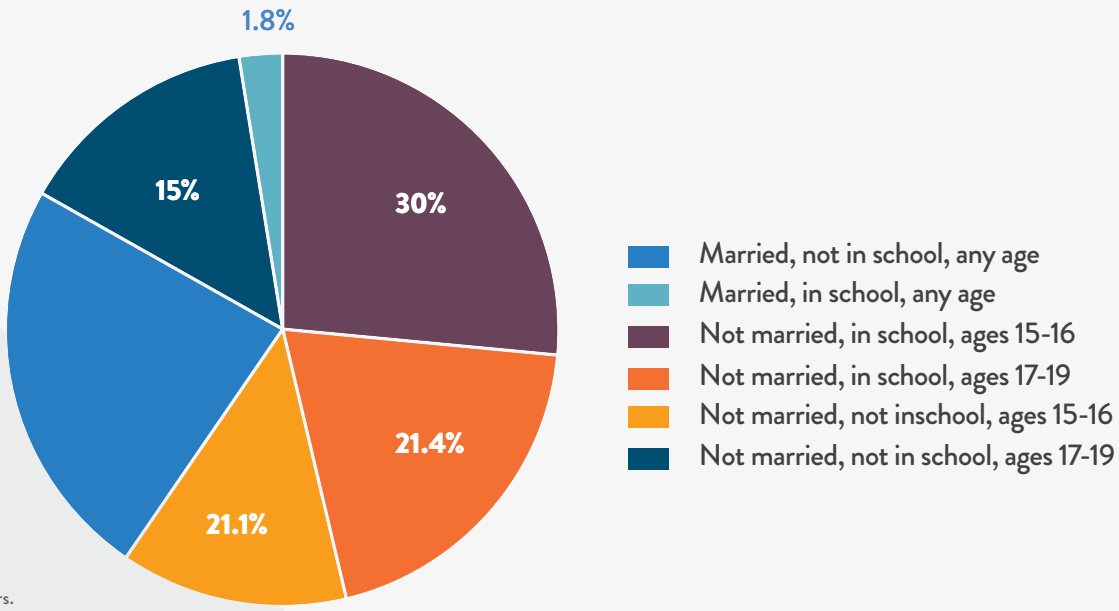
3. *Lack of nearby secondary schools.* Few rural communities have their own secondary school and there are few boarding schools serving communities. Parents must send their children to nearby towns and cover the costs of transportation and room and board. Students stay with relatives or contacts and parents are reluctant to leave their daughters without what they consider proper oversight.

4. *Forced withdrawal of married adolescents.* Once a girl is married, she is likely to be expelled from school. Husbands show little interest in providing financial support for their adolescent wife's education especially if they must enroll in a private school. Conversely, the fear of not being allowed to withdraw their daughters from school for marriage is a complaint of some parents.

5. *Never enrolling in school or enrolling too late.* Some families never enroll girls in school, perhaps in part because parents had no educational opportunities themselves. In some cases, teachers may refuse to enroll children that are considered too old to start primary school.

6. *Influence of relatives and demands on first daughters.* Extended family members may influence parents on the value of educating girls, not always with positive outcomes. Schooling decisions may also depend on household composition and the activities of other children. Being the first daughter lessens a girl's chances of going to school as they are expected to help their mother at home during the day.

Figure 4: Typology of Adolescent Girls Aged 15-19



Source: Authors.

DOMAIN 3: FERTILITY AND POPULATION GROWTH

TOTAL FERTILITY

Reducing fertility rates may not be an objective in itself, but high rates of population growth driven by high fertility come with various consequences – not least is a stalled demographic dividend and high burdens on governments to maintain (let alone increase) public investments in children as well as adults. While gender inequality in earnings affects levels of human capital wealth, fertility rates affect levels of wealth per capita through high rates of population growth. By definition, the rate of growth in total wealth per capita over time is equal to the rate of growth in total wealth minus the rate of growth of the population. A high rate of growth of the population makes it more difficult to achieve gains in levels of per capita wealth. Table 10 provides total fertility rates as well as population growth rates by region and income group. Especially in sub-Saharan Africa and in low income countries, fertility rates and population growth rates remain high. Population growth rates depend in part on fertility rates, namely the number of children that women are expected to have on average over their lifetime (i.e. throughout their childbearing years according to age-specific fertility rates). There is a time lag between declines in fertility rates and declines in population growth. This is because apart from fertility rates, annual rates of population growth depend also on the share of the population of childbearing age, which may remain large for some time even after fertility rates have declined. Nevertheless, reducing fertility rates is necessary to reduce population growth rates and thereby increase wealth per capita.

The factors leading to fertility are complex. The proximate determinants of fertility include the rate of marriage in the population, the rate of contraceptive use, the rate of abortion, and the average post-partum infecundity duration (Bongaarts model). There is therefore a strong relationship between various aspects of gender inequality and women's fertility. For example, girls who drop out of school prematurely, marry early, or have children early are likely to have more children over their lifetime. Social norms pertaining to gender roles also lead women to have more children over their lifetime, since they are often seen in traditional societies through their reproductive, as opposed to their productive role (acknowledging that this distinction is itself often driven by social norms). For this study, we consider the impact of gender inequality on total fertility defined as the number of live births that women are expected to have over their lifetime. We then extend this analysis to look at implications for population growth and standards of living and levels of wealth per capita.

The impact of gender equality is simulated by assuming: (1) no child marriage; (2) women having the same education as men; (3) higher earnings which lift households who are in the poorest quintile to the second quintile of well-being, and households in the second quintile to the third; (4) a reduction in the spousal age gap (the difference in age between the wife and her husband/partner) to less than 10 years; (5) women being involved in most decisions made in the household; and (6) women not accepting wife beating (an outcome assuming to result from gender equality).Under these assumptions, the impact of gender inequality on fertility is obtained by comparing predicted fertility under gender equality and predicted fertility under current conditions for 19 countries. For perspective, the impact of gender equality is also compared to that of ending child marriage and achieving universal secondary education for girls.

The estimated impacts of gender inequality are large. On average across the 19 countries, under the simulations for gender equality, total fertility would be reduced by 0.70 children per women towards the end of their reproductive life (Table 11). This represents a reduction in fertility of, on average, 13.1 percent. The largest share of this effect comes from the impact of child marriage on total fertility. Ending child marriage by itself could reduce total fertility by 0.5 children per women. Achieving universal secondary education for girls could lead to an even larger reduction in total fertility.

Table 10: Total Fertility Rates (Births per Woman) and Population Growth Rates (%), 1995-2016

	1995	2000	2005	2010	2015	2017
	Total fertility rates (number of births)					
Regions						
East Asia & Pacific	1.95	1.79	1.79	1.80	1.81	1.80
Europe & Central Asia	1.65	1.56	1.59	1.73	1.75	1.75
Latin America & Caribbean	2.90	2.62	2.36	2.19	2.09	2.06
Middle East & North Africa	3.91	3.20	2.89	2.88	2.81	2.77
North America	1.94	2.00	2.00	1.90	1.82	1.78
South Asia	3.85	3.46	3.10	2.74	2.49	2.46
Sub-Saharan Africa	6.02	5.77	5.52	5.25	4.92	4.85
Income Groups						
Low income	6.10	5.80	5.46	5.08	4.71	4.63
Lower middle income	3.79	3.44	3.19	2.96	2.79	2.76
Upper middle income	2.04	1.83	1.81	1.82	1.83	1.83
Middle income countries	2.86	2.60	2.48	2.40	2.34	2.33
High income	1.75	1.74	1.70	1.73	1.69	1.68
World	2.86	2.67	2.57	2.51	2.45	2.44
	Population growth rates (%)					
Regions						
East Asia & Pacific	1.21	0.94	0.75	0.68	0.68	0.68
Europe & Central Asia	0.19	0.11	0.30	0.39	0.48	0.47
Latin America & Caribbean	1.69	1.45	1.28	1.21	1.08	1.05
Middle East & North Africa	2.73	1.95	2.02	2.15	1.89	1.81
North America	1.16	1.10	0.93	0.86	0.77	0.78
South Asia	2.06	1.87	1.66	1.44	1.30	1.27
Sub-Saharan Africa	2.74	2.67	2.72	2.77	2.74	2.72
Income Groups						
Low income	2.86	2.73	2.80	2.70	2.58	2.58
Lower middle income	1.94	1.77	1.64	1.55	1.47	1.44
Upper middle income	1.16	0.93	0.76	0.75	0.77	0.77
Middle income countries	1.54	1.35	1.21	1.17	1.14	1.13
High income	0.88	0.63	0.71	0.67	0.61	0.60
World	1.51	1.32	1.25	1.22	1.19	1.18

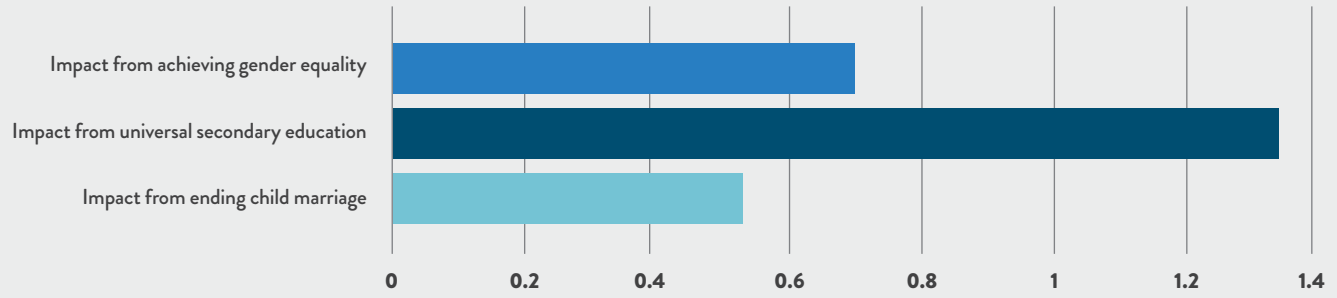
Source: World Bank's World Development Indicators.

Table 11: Potential Impact of Gender Equality on Women's Total Fertility

	Absolute difference	Percentage difference (%)
Impact from universal secondary education	-0.52	-9.61
Impact from achieving gender equality	-1.31	-23.14
Impact of early childbearing due to child marriage	-0.70	-13.12

Source: Authors, based Onagoruwa and Wodon (2018a). Regression analysis based on DHS data considering the number of children women have towards the end of their reproductive age (women aged 35-49 for sample size reasons).
Note: Estimates are based on country-level analysis for 19 developing countries.

Figure 5: Reduction in Total Fertility Under Various Scenarios



Source: Authors' estimation using DHS data.

MODERN CONTRACEPTIVE USE

Unmet demand for family planning remains a widespread issue especially in low income countries. Access to modern contraception is a key aspect to ensuring sexual reproductive health and rights as well as agency for girls and women. The effect of gender inequality is measured using regression analysis by assuming (1) no child marriage; (2) women having the same education as men; (3) higher earnings which lift households who are in the poorest quintile to the second quintile of well-being, and households in the second quintile to the third; and (4) women's decision-making index is increased. As with fertility, we compare predicted modern contraception use under gender equality to observed use, benchmarking impacts versus ending child marriage and universal secondary education.

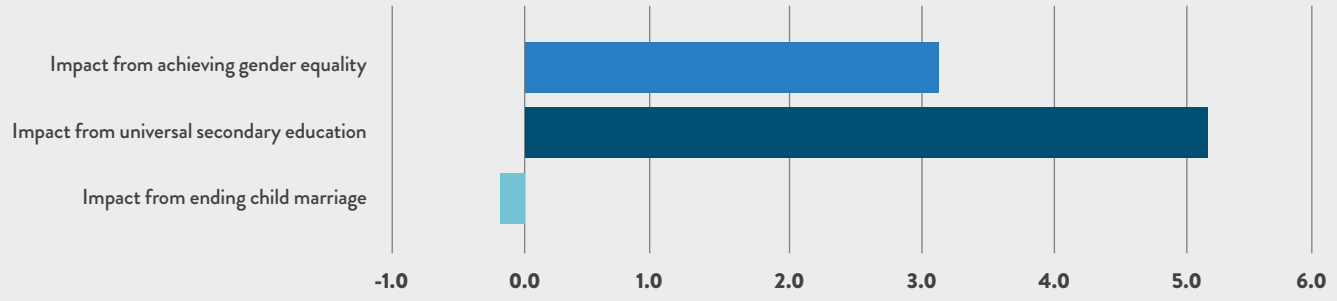
As simulated in the regression analysis, the estimated impacts of gender equality on contraceptive use are relatively small. On average across the 19 countries, under gender equality, modern contraceptive use would increase by 2.6 percentage points (Table 12). This represents an increase of 12.1 percent given the low use of such methods in those countries today. Note that eradication of child marriage plays virtually no role in the impacts on average. Under universal secondary education, the gains in contraceptive use would be about twice larger than observed under our composite measure of gender equality. While increasing modern contraceptive use will bring down fertility, the pathway from gender inequality to use is not as strong as observed for other outcomes.

Table 12: Potential Impact of Gender Equality on Women's Use of Modern Contraception

	Absolute difference	Percentage difference (%)
Impact from ending child marriage	-0.16	0.64
Impact from universal secondary education	5.15	26.57
Impact from achieving gender equality	2.62	12.06

Source: Authors. Regression analysis based on data from Demographic and Health Surveys.
Note: Estimates are based on country-level analysis for 19 developing countries. Average potential impacts reported for countries where coefficients for the variables of interest are statistically significant.

Figure 6: Increase in Modern Contraceptive Use Under Various Scenarios



Source: Authors' estimation using DHS data.

POPULATION GROWTH

Through its potential impact on total fertility, gender inequality contributes to population growth. High population growth driven by high fertility (and underpinned by high unmet needs and lack of female empowerment) can contribute to poverty by delaying the demographic transition. Building on work on the impact of child marriage and early child-bearing on population growth, estimations of the potential impacts of gender inequality are based on a parametrization of demographic projection simulation models. The approach consists of reporting results obtained for child marriage and early childbearing using these demographic projection models, and scaling those results up to account for the larger potential impact on total fertility rates of gender inequality in comparison to the impact of child marriage. On average across 18 countries, the annual rate of growth in those countries could be reduced by 0.18 percentage point if child marriage and early childbearing were eliminated (Table 13). In some countries, the potential effect is larger, as is the case in Niger. Given the comparative potential effects on total fertility of child marriage documented earlier, a straight extrapolation for a slightly different set of countries suggests that the average potential impact of gender inequality on population growth across these countries could be at about 0.26 percentage point.

Table 13: Simulated Potential Impact of Gender Equality on Population Growth

	Reduction in Annual Rate of Population Growth (Percentage Points)
Estimates with demographic projection tools	
Ending child marriage and early childbearing	-0.18
Estimates based on comparative potential impacts on fertility	
Gender inequality	-0.26

Source: Authors.

Note: Estimates based on analysis for 18 developing countries with extrapolations for more than 100 countries.

DOMAIN 4: HEALTH, NUTRITION, WELL-BEING, AND VIOLENCE

CHILDREN'S HEALTH AND SURVIVAL

Early childhood is critical for a child's development, including brain development with lasting consequences in adulthood (Black et al., 2017). As gender inequality affects households, specifically mothers (via early pregnancies, lower decision-making, domestic violence and mental health, among others), it may generate spillover effects for children. In harsh conditions, so-called toxic stress responses on the part of children can have damaging effects on learning, behavior, and health later in life. Children born of younger mothers have higher risks of under-five mortality and malnutrition than children born of older mothers. A large literature shows that such poor childhood conditions result in life-long consequences on productivity and well-being (Harper et al., 2003; in the case of the consequences of child marriage, see for example Wodon, 2016). Table 14 provides trends by regions and income groups in under-five mortality and stunting rates. As for many other indicators, rates remain much higher in sub-Saharan Africa and South Asia, and in low-income countries.

The focus is on measuring the impact of gender inequality for mothers on under-five mortality and stunting (as a measure of malnutrition). The impact of gender equality on these two child health outcomes is estimated for 19 countries with seven indicators for gender equality: (1) no early childbearing; (2) women having the same education as men; (3) higher earnings which lift households who are in the poorest quintile to the second quintile of well-being, and households in the second quintile to the third; (4) the spousal age gap (the difference in age between the wife and her husband/partner) is less than 10 years; (5) women are involved in most decisions made in the household; (6) women do not accept wife beating; and (7) women do not need to consult others to access healthcare for themselves. For under-five stunting, the approach is very similar. The impact of gender inequality on rates of under-five malnutrition and stunting is obtained by comparing predicted rates under current conditions with the rates predicted under gender equality. Comparisons are again provided, this time with the impact of ending early childbearing and achieving universal education for girls.

The estimated impacts of gender inequality are relatively small. On average across the 19 countries, under gender equality, under-five mortality rates would be reduced by 0.32 percentage point (Table 15). This represents a reduction of slightly more than five percent compared to the base rates. For under-five stunting, the reduction is estimated at 2.1 percentage points. This represents a reduction of just under seven percent versus the base rates. Note that eliminating early childbearing results in smaller impacts, especially for stunting This is because while the marginal impact of an early childbirth (being born of a mother younger than 18) on the risks of under-five mortality and stunting is relatively large, only a small share of children are born from mothers younger than 18. In other words, even large effects at the margin do not imply major shifts nationally. While gender equality would make a difference, it would not reduce under-five mortality and stunting dramatically in terms of the share of young children affected. Still, in terms of the number of children affected, achieving gender equality would improve survival and nutrition for a sizeable number of children.

Table 14: Under-five Mortality Rates (per 1,000) and Stunting Rates (%)

	1995	2000	2005	2010	2015	2016	2017
	Under-five Mortality Rates (per 1,000)						
Regions							
East Asia & Pacific	49.1	39.7	29.3	21.9	17.1	16.4	15.8
Europe & Central Asia	27.6	21.7	16.1	12.5	9.9	9.4	9
Latin America & Caribbean	43.1	33	25.7	24.4	18.3	18.3	17.7
Middle East & North Africa	53.1	42.6	34	27.6	24.2	23.6	23.1
North America	9.2	8.3	7.8	7.2	6.7	6.6	6.5
South Asia	111.8	93.8	77.2	62.5	49.3	46.9	44.8
Sub-Saharan Africa	172.3	153.7	126.2	100.9	81.4	78.3	75.5
Income Groups							
Low income	165.7	143.2	115	93.5	74.4	71.6	69.1
Lower middle income	109.1	94.8	78.8	64.3	52.4	50.4	48.5
Upper middle income	44.6	35.6	26.3	19.2	14.9	14.4	13.7
Middle income countries	84.16	73.41	60.15	48.05	38.91	37.5	36.18
High income	10.5	8.6	7.4	6.5	5.7	5.6	5.4
World	87.1	77.1	63.5	51.5	41.9	40.5	39.1
	Under-five Stunting Rates (%)						
Regions							
East Asia & Pacific	30	24.6	20	16.2	13.1	12.6	12.2
Europe & Central Asia	-	-	-	-	-	-	-
Latin America & Caribbean	19.7	16.9	14.4	12.2	10.3	9.9	9.6
Middle East & North Africa	25.6	22.8	20.3	17.9	15.8	15.4	15
North America	3.3	3	2.8	2.6	2.4	2.3	2.3
South Asia	56.2	51.3	46.4	41.5	36.8	35.9	35
Sub-Saharan Africa	45.9	43.2	40.4	37.7	35.1	34.6	34.1
Income Groups							
Low income	50.6	47	43.4	39.9	36.5	35.9	35.2
Lower middle income	49.9	45.5	41.2	37	33	32.2	31.5
Upper middle income	24.4	18.5	13.8	10.1	7.3	6.9	6.4
Middle income countries	39.4	35.4	31.3	27.3	23.6	23	22.4
High income	3.7	3.4	3.1	2.8	2.6	2.5	2.5
World	35.6	32.6	29.3	26.1	23.2	22.7	22.2

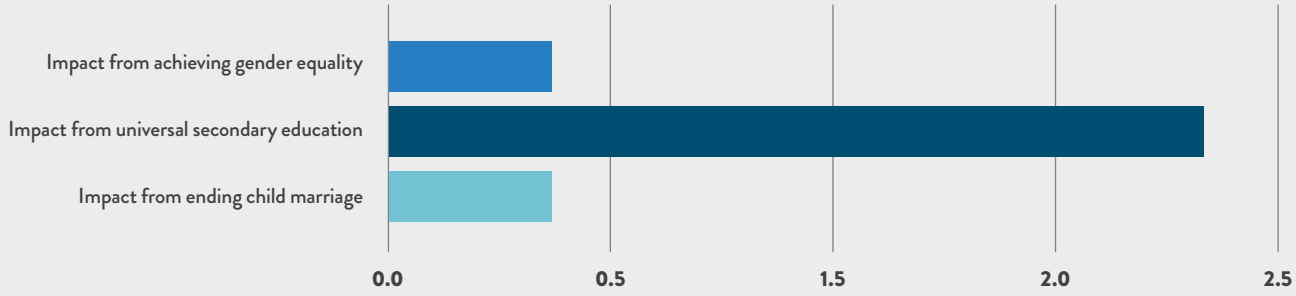
Source: World Bank's World Development Indicators.
Note: Stunting rates are not available for Europe and Central Asia.

Table 15: Potential Impact of Gender Equality on Rates of Under-five Mortality and Stunting

	Absolute difference	Percentage difference (%)
Under-five mortality		
Impact from ending child marriage	0.30	4.83
Impact from universal secondary education	2.23	30.51
Impact from achieving gender equality	0.32	5.36
Under-five stunting		
Impact from ending child marriage	0.35	0.97
Impact from universal secondary education	12.83	34.89
Impact from achieving gender equality	2.08	6.97

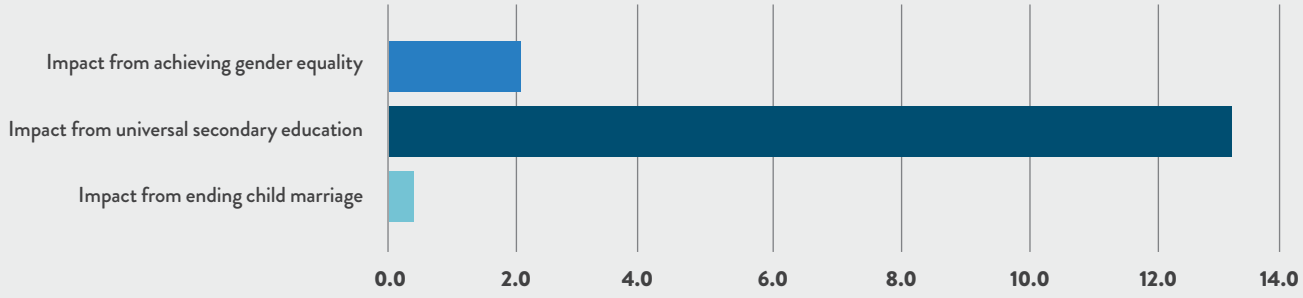
Source: Authors. Regression analysis based on data from Demographic and Health Surveys.
Note: Estimates are based on country-level analysis for 19 developing countries. Average potential impacts reported for countries where coefficients for the variables of interest are statistically significant.

Figure 7: Reduction in Under-five Mortality Under Various Scenarios



Source: Authors' estimation using DHS data.

Figure 8: Reduction in Under-five Stunting Under Various Scenarios



Source: Authors' estimation using DHS data.

WOMEN'S HEALTH AND VIOLENCE

Gender inequality may have potential negative impacts on women's health for multiple reasons. Giving birth at a very early age raises the risk of maternal mortality (Nove et al., 2014). A lack of physical maturity when giving birth may lead to complications such as obstructed or prolonged labor as well as fistula. Other health risks related to gender inequality may include malnutrition and depression, as well as negative sexual and reproductive behaviors. This last risk can lead not only to exposure to sexually transmitted infections, but also to lower rates of modern contraceptive use, insufficient birth spacing, unwanted pregnancies, and abortions.

Gender inequality, for example through low educational attainment, may also lead to lack of knowledge about sexually transmitted diseases such as HIV/AIDS, in part through its effect on educational attainment. The literature also suggests that women's choices are often constrained, for example in terms of how/where to deliver a baby. Sometimes the husband or partner may make these decisions, or it may be made by the mother in law in some cultures. The same can be said about decisions for antenatal care, which impacts the health and well-being of the mother and the future newborn. A simple measure of gender inequality in health is whether women must ask permission to their husband partner simply to seek healthcare for themselves when sick or injured. As shown in Table 16 based on DHS data for 19 developing countries, in more than 40 percent of cases the decision as to whether women may seek healthcare for themselves is made by their husband or partner alone instead of the women themselves or by women jointly with their partner (decisions made jointly may not be sub-optimal versus decisions made by women alone, but when decisions are made by partners alone without women being able to contribute to decision-making, this can have negative consequences for women's health).

Table 16: Ability of Women to make Decisions to Seek Healthcare for Themselves

Category	Share (%)
Decision made by women alone	15.98
Decision made by women and husband/partner	40.64
Decision made by husband/partner alone	40.60
Decision made by someone else and other categories	2.79
All categories	100.00

Source: Authors' estimation using DHS data.

Another form of gender inequality leading to health risks for women is gender-based violence (GBV). Violence is ubiquitous at home, in school, at work, and in communities. The World Health Organization (1996) defines violence as "the intentional use of physical force or power, threatened or actual, against a person or group that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation." The harm can be actual or threatened. It can lead to injury or death, but also to trauma and mental health symptoms. Three main types of violence are often distinguished: sexual violence (any sexual act, intimidation, attempt to obtain a sexual act, unwanted sexual comments or advances against another individual using coercion), emotional or psychological violence (including verbal and emotional abuse, such as isolating, rejecting, ignoring, insulting, spreading rumors, making up lies, name-calling, ridiculing, humiliating and threatening), and physical violence (any form of physical aggression with intent to hurt another person). While the consequences of some forms of violence may not be highly visible, they are nevertheless always damaging. Violence is also often multidimensional, meaning that individuals are often subjected to multiple forms of violence and in multiple locations.

Violence affects boys as well as girls, and men as well as women, but GBV is especially severe in many countries and often condoned by social norms (Garcia-Moreno et al., 2005). GBV can lead to negative and at times dramatic health consequences for women (World Bank, 2012, 2016). It leads to increased absenteeism at work and limits mobility, thereby reducing productivity and earnings. It may force girls to drop out of school, and when going to school it puts them at risk of abuse. It affects agency, including whether women can seek care when needed. As is the case for violence more generally, GBV may take many forms, including not only physical and sexual violence, but also emotional, and even

economic violence, as well as harassment experienced in public and in places of work and education. In the case of violence against children, estimates suggest that boys are slightly more likely to be affected by physical violence, but girls are much more likely to be affected by sexual violence. For emotional violence, estimates are somewhat similar between the two groups (the estimates provided in Table 17 do not include the risk of bullying which is highly pervasive in schools and similar in terms of prevalence for boys and girls; see Wodon et al., 2020, for details). Beyond the individual harm inflicted on women and their families, GBV is a global problem with substantial economic costs. While this study does not provide estimates of the economic costs of violence against women, a growing body of evidence measures these costs. In Vietnam, the estimated loss in productivity, out-of-pocket expenditures, and foregone income for households is at 3.3 percent of GDP (Duvvury et al., 2013; see also earlier work by Morrison and Orlando, 1999). Other studies also find a large economic cost of violence (CARE 2010 for Bangladesh, CEDOVIP 2016 for Uganda, and Vara 2014 for Peru), and guidance is available from the literature on what works to prevent GBV (Ellsberg et al., 2014; see also the resources available under DFID's What Works Initiative). As is the case for many other aspects of gender inequality discussed in this study, it is also worth noting that there are relationships between issues such as child marriage and the lack of education for girls and the risk of violence, especially for intimate partner violence (IPV). Ending child marriage and increasing girls' schooling could bring with it a reduction in IPV (Savadogo and Wodon, 2019).

Table 17: Likelihood of Children Being Affected by Various Forms of Violence

Category	Share for Boys (%)	Share for Girls (%)
Physical violence	58.68	55.49
Emotional violence (not including bullying)	7.64	5.79
Sexual violence	16.99	25.09

Source: Wodon et al. (2020), based on Violence against Children Surveys for eight developing countries.

DOMAIN 5: AGENCY, DECISION-MAKING, AND SOCIAL CAPITAL

WOMEN'S DECISION-MAKING

Gender inequality is associated with losses in decision-making (solo or joint) for girls and women. For example, child brides are often vulnerable—they are young, often poorly educated, and from disadvantaged socio-economic backgrounds (Parsons et al., 2015). When they marry early, they may fall even more under the control of their husband and in-laws than would be the case if they had married later. This may limit their aspirations, as well as agency (Klugman et al., 2014), possibly limiting their decision-making, including for access to health care during pregnancy and delivery.

To assess the impact of gender inequality on decision-making, an index is constructed through principal component analysis to reflect four categories of decision-making[3]. The index considers whether women are able to make decisions either by themselves or jointly with their partner in a number of different areas. Similar to the analysis for total fertility, contraceptive use, stunting and under-five mortality, the potential impact of gender equality is captured through regression analysis using the following proxies for gender equality: (1) no child marriage; (2) women having the same education as men; (3) higher earnings which lift households who are in the poorest quintile to the second quintile of well-being, and households in the second quintile to the third; (4) the spousal age gap (the difference in age between the wife and her husband/partner) is less than 10 years; (5) women do not accept wife beating; (6) women are as likely as men to work; and (7) several variables related to women's decision-making in the village or area where a specific woman lives are assumed to be improved (leave-out-mean variables at the level of the survey's primary sampling units). Comparisons are again provided with the potential impacts on the index of decision-making of ending child marriage and achieving universal secondary education.

Table 18 and Figure 9 provide the average impacts observed across the same set of 19 countries as before in absolute terms (increase in the share of women using modern contraception methods) and proportional terms (increase in contraceptive use in percentage terms from the base value). The estimated impacts are large. On average across the 19 countries, under gender equality, women's decision-making would increase by close to 24 points. This represents an increase of almost half from the average base index. In this case, the impacts are larger than those estimated for child marriage and educational attainment for women, in part because community-level factors including those related to decision-making for women play a large role in affecting individual-level decisions, and those factors are expected to improve once gender equality is achieved.

Table 18: Potential Impact of Gender Inequality on Women's Decision-making

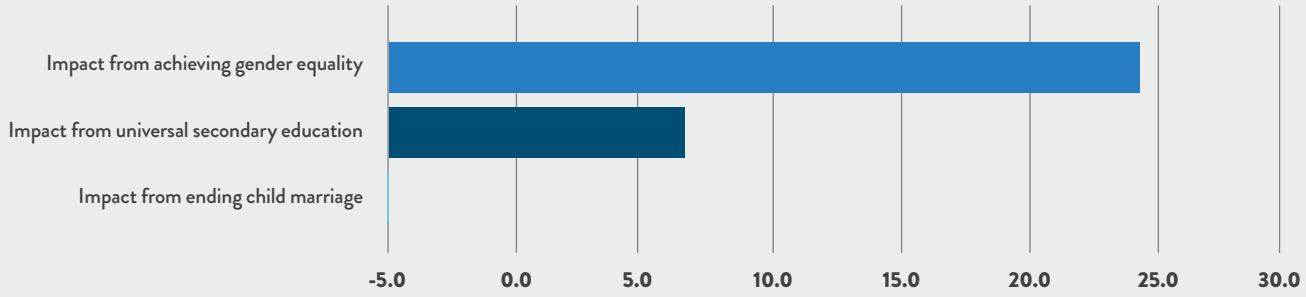
	Absolute difference	Percentage difference (%)
Impact from ending child marriage	-0.01	0.21
Impact from universal secondary education	7.15	13.13
Impact from achieving gender equality	23.85	44.89

Source: Authors. Regression analysis based on data from Demographic and Health Surveys.

Note: Estimates are based on country-level analysis for 19 developing countries. Average potential impacts reported for countries where coefficients for the variables of interest are statistically significant.

[3] First, married women are asked in the surveys about who makes decisions in the household in four areas: health care, household purchases, visits to friends and relatives, and the use of the husband's earnings. Second, women are asked if they can refuse to have sex with their husband and if they can request their husband to use a condom when having sex. Third, women respond to four different circumstances assessing if a husband is justified in beating their wife in those instances. Finally, women are asked whether getting their husband's permission to get medical help for themselves is a major problem or not. When joint decision making is included in the potential answers, this is considered as decision-making ability for the woman in the same way as sole decision-making is. The index takes a value between zero and 100. Sensitivity analysis suggest that the results tend not to be affected much whether the index includes all or only part of these decisions – for example, results remain when decisions related to household purchases are not included.

Figure 9: Increase in Decision-making Under Various Scenarios



Source: Authors' estimation using DHS data.

BIRTH REGISTRATION

Another indicator related to women's agency is birth registrations. The benefits of birth registration are important for children, not only for the exercise of a range of fundamental rights, but also for being able to assess the age of girls at marriage. How could gender inequality affect birth registration rates? One example relates to countries where laws against child marriage are enforced, but the practice continues nevertheless. In such cases, young mothers might be hesitant to register their children at birth or other members of the household may decide that the child should not be registered. While it is likely that other factors than child marriage or early childbearing would have a larger effect on birth registration rates (see for example Wodon and Yedan, 2019, on Niger), gender inequality could have an effect. The procedure to measure the potential impact of gender inequality on the likelihood of birth registration is again the same as for other DHS-based indicators. The impact of gender equality on birth registration is measured using the following assumptions based on the correlates used in the regression analysis: (1) child marriage is eliminated; (2) women are assumed to have the same education as men; (3) gender inequality is assumed through higher earnings for women to lift households who are in the poorest quintile to the second quintile of well-being, and households in the second quintile to the third; and (4) women are assumed to be involved in a larger share of decisions within the household (this is done through leave-out-mean variables at the level of the survey's primary sampling units).

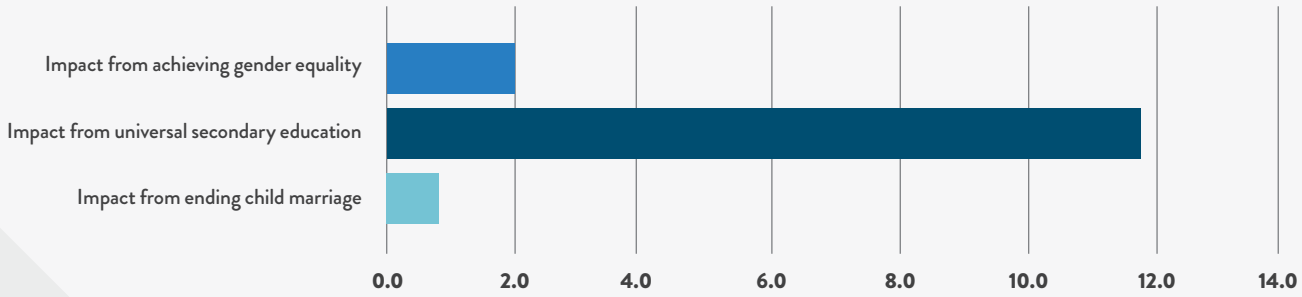
The estimated impacts are relatively small (Table 19). On average across the 19 countries, under gender equality, the birth registration rate would increase by only two percentage points. This represents an increase of about five percent from the average base value. The impacts are smaller than those that would result from achieving universal secondary education for girls. Figure 10 visualizes the estimates.

Table 19: Potential Impact of Gender Inequality on Birth Registration

	Absolute difference	Percentage difference (%)
Impact from ending child marriage	0.68	1.05
Impact from universal secondary education	11.64	28.89
Impact from achieving gender equality	2.04	4.62

Source: Authors. Regression analysis based on data from Demographic and Health Surveys.
Note: Estimates are based on country-level analysis for 19 developing countries. Average potential impacts reported for countries where coefficients for the variables of interest are statistically significant.

Figure 10: Increase in Birth Registration Rate Under Various Scenarios



Source: Authors' estimation using DHS data.

BOX 14: ALTRUISTIC BEHAVIORS, FRIENDSHIPS AND SUPPORT NETWORKS, AND SOCIAL INSTITUTIONS

Using the Gallup world poll, Wodon et al. (2018) look at the potential impact of women's educational attainment on (1) whether women made in the past month a monetary contribution to a charity; (2) whether they volunteered their time with any organization in the past month; and (3) whether they helped a stranger or someone they did not know who needed help. A secondary education is associated with an increase in the three behaviors of four to six percentage points versus primary education. For tertiary education, the increase is at 10 to 14 points. Two other questions in the Gallup World Poll relate to whether women are satisfied with their opportunities to make friends, and whether they can rely on these friends when in need. In comparison to women with only a primary education or less, a higher level of education is not associated with an increase in the opportunity to make friends, but it is associated with a higher ability to rely on such friends when in need. Gender inequality could thus reduce altruistic behaviors and social capital through its impact on educational attainment.

SELECTED POTENTIAL ECONOMIC COSTS

MEASUREMENT APPROACH AND BASELINE WEALTH ESTIMATES

Gender inequality has major potential negative impacts for girls and women, their children and their households, their communities, and societies. Some of these potential impacts have been documented in previous sections. What are the economic costs associated with those potential impacts? In many cases, this is a hard question to answer, but for a few potential impacts, estimations can be provided. The focus in this section is on three impacts: (1) Lost human capital wealth due to gender inequality in lifetime earnings; (2) Lost human capital wealth due to the impact of gender inequality on under-five stunting rates; and (3) Welfare effects from high population growth. While this is clearly not an exhaustive list of impacts, it probably captures some of the largest economic costs of gender inequality. The measurement of costs is based on data on the changing wealth of nations and specifically human capital wealth (Hamilton et al., 2018). Arguments for using a wealth as opposed to an income approach were provided earlier when discussing the impact of gender inequality on labor earnings.

Table 20 provides global wealth estimates in constant US dollars of 2014. As estimated in Lange et al. (2018), global wealth stood at US$1,143 trillion in 2014, suggesting an increase in real terms of 66 percent over 20 year. Human capital wealth was at US$737 trillion. Globally, human capital accounts for more than two thirds of total wealth, versus just under one tenth for natural capital and about a quarter for produced capital. In per capita terms, total wealth stood

at US$168,580 per person in 2014 versus US$128,929 in 1995. Human capital wealth stood at US$108,654 per person in 2014 versus US$88,874 in 1995. As will be shown in subsequent sections of this note, inequality in human capital and total wealth between countries is high. In high income OECD countries, total wealth per capita is above US$700,000, and human capital wealth is at close to US$500,000 per person. This is more than 90 times the levels in low income countries where human capital wealth is at US$5,564 per person. In Table 19, estimates are also provided for 2017 for human capital wealth based on projections in order to provide updated values for losses in wealth due to gender inequality in earnings for that year. The projected estimates for 2017 are higher than those for 2014 due to both growth in real terms in GDP per capita and thereby in labor earnings, and growth in population sizes for most of the countries.

At the global level, the dynamics of human capital wealth accumulation are driven by shifts in OECD and upper-middle income countries simply because those countries account for 87 percent of global wealth (65 percent for the OECD alone). The proportions are even larger for human capital wealth. In these countries, the share of human capital wealth in total wealth has fallen slightly in recent years in part because labor earnings as a share of GDP have declined in OECD countries due to technological change, stagnating wages, and in some countries a reduction in the share of the population in the labor force due to ageing. By contrast, for low income and lower middle-income countries, the share of human capital wealth in total wealth is increasing as countries achieve higher levels of economic development. At lower levels of economic development, natural capital continues to account for a larger share of wealth. Many developing countries are experiencing a demographic transition and are reaping benefits from the demographic dividend as population growth rates slow and the population is becoming better educated. But this is not the case for all countries, especially in sub-Saharan Africa.

LOSS IN HUMAN CAPITAL WEALTH FROM GENDER INEQUALITY IN EARNINGS

Estimations of human capital wealth are done separately for men and women. Losses in human capital wealth due to gender inequality are calculated by raising earnings for women to the level of men without losses for men, taking into account the proportions of men and women in the adult population (see Appendix 2 for details). Consider first the estimates for 2014 in Table 21. As mentioned earlier, on a per

Table 20: Baseline Estimates of Global Wealth, 1995-2014

	1995	2000	2005	2010	2014	2017(*)
	Total wealth, Trillions, constant 2014 US$					
Total wealth	689.9	790.9	889.1	1,024.7	1,143.2	NA
Produced capital	164.8	187.9	226.9	269.0	303.5	NA
Natural capital	52.5	54.2	70.0	97.2	107.4	NA
Human capital	475.6	552.7	595.4	661.1	736.9	781.9
Net foreign assets	-2.9	-3.9	-3.3	-2.6	-4.6	NA
Population (billions)	5.35	5.73	6.09	6.47	6.78	NA
	Per capita wealth, constant 2014 US$					
Total wealth	128,929	138,064	145,891	158,363	168,580	NA
Produced capital	30,793	32,801	37,237	41,570	44,760	NA
Natural capital	9,803	9,463	11,487	15,019	15,841	NA
Human capital	88,874	96,478	97,707	102,170	108,654	NA
Net foreign assets	-540	-678	-539	-395	-676	NA
	Share of total wealth					
Total wealth	100%	100%	100%	100%	100%	NA
Produced capital	24%	24%	26%	26%	27%	NA
Natural capital	8%	7%	8%	9%	9%	NA
Human capital	69%	70%	67%	65%	64%	NA
Net foreign assets	0%	0%	0%	0%	0%	NA

Source: Lange et al. (2018).
Note: Estimates for human capital wealth in 2017 are projections.

capita basis including not only the adult population but also children, losses in wealth are estimated at US$23,620 per person. Globally, women's human capital could increase from US$283.6 trillion to US$453.2 trillion with gender equality. This would be a gain in global wealth from gender equality of US$160.2 trillion in 2014 (about twice the value of global GDP). This gain represents 21.7 percent of human capital wealth and 14.0 percent of total wealth including natural and produced capital and net foreign assets.

Over time, total wealth lost due to gender inequality increases from US$123.2 trillion in 1995 to US$160.2 trillion in 2014. This increase comes from population growth, as well as higher standards of living. But other factors that affect human capital wealth at the country and regional level also play a role. As a share of baseline wealth, losses from gender inequality tend to be slightly lower in 2014 than in 1995. This is in part because there is a (slow) movement towards more gender equality in earnings in many countries over time, which makes the losses smaller. But in addition, human capital in high income countries has been declining slightly in recent years due among others to ageing and a reduction in the share of labor income in GDP. This leads to a small reduction in losses from gender inequality over time as a share of the baseline global wealth.

Projections for the losses in human capital wealth due to gender inequality in earnings for 2017 are at US$172.3 trillion globally, a higher value than the estimate for 2014. As already mentioned, this results not only from growth in real terms in GDP per capita and thereby in labor earnings, but also from growth in population sizes for most of the countries. These estimates are based on the gender shares in human capital wealth observed in 2014, but these shares tend to change slowly over time, so no major bias is to be expected.

How do these results compare to previous studies? The McKinsey Global Institute (2015) study reports potential gains in GDP from a 'full potential' gender equality scenario of US$28 trillion or 26 percent of GDP in 2025 versus a 'business-as-usual' scenario[4]. We report losses in human capital wealth from gender inequality of US$160 trillion or 14 percent of our baseline estimate of global wealth in 2014. Our estimate is larger in absolute value because wealth is larger than GDP. In 2014, global wealth is estimated at US$1,143 trillion for the 141 countries included in our analysis, while global GDP for those countries is estimated at US$75 trillion[5]. Wealth is thus 15 times larger than GDP. But in proportionate terms, our estimate is more conservative. We suggest a loss of 14 percent of baseline wealth. This is smaller than the loss of 26 percent of GDP suggested in the McKinsey Global Institute study. As discussed in Wodon (2018), various factors could account for the difference in proportional impacts, including the fact that our estimates of human capital wealth account for the labor share in GDP. Still, both types of estimates are only meant to give orders of magnitude of potential losses from gender inequality as opposed to precise values. Clearly, the losses from gender inequality are potentially very large.

The largest losses in wealth from gender inequality are observed for East Asia and the Pacific, North America, and Europe and Central Asia, in each case at between US$40 trillion and US$50 trillion in 2014. This is because these regions concentrate much of the world's human capital wealth. In per capita terms as well, the losses are larger in those regions. But losses in other regions are substantial too, including in comparison to current levels of development. In South Asia, losses from gender inequality are estimated at US$9.1 trillion. In sub-Saharan Africa, losses are at US$2.5 trillion or 11.4 percent of the base regional wealth. The loss in wealth from gender inequality as a share of baseline wealth is highest in South Asia, the region with the lowest share of women in human capital due to low labor force participation among women. Table 21 also shows that the largest total losses in wealth are observed as expected for high income OECD countries and upper-middle income countries (which include China). Together these two groups of countries experience a loss of US$140.2 trillion in human capital wealth due to gender inequality. The other countries together lose US$20 trillion in human capital wealth. But again, in percentage terms from the base, the picture is different. Low income countries lose 15.1 percent of their base level of wealth (including all types of capital) under gender inequality, which is slightly larger than the increase for the world, at 14.0 percent. Note also that losses from gender inequality are lower in proportional terms from the base in high-income non-OECD countries, in part because many of these countries have substantial oil reserves and thereby higher levels of natural capital in their baseline wealth.

[4] The McKinsey study also considered a best-in-region scenario in which all countries would match the rate of improvement of the best-performing country in their region. This would add $12 trillion in annual GDP by 2025.

[5] Our estimation includes a larger set of countries than included in the McKinsey Global Institute study, although this does not make a very large difference for estimates of global losses given that most of the wealth, especially for human capital wealth, remains concentrated in upper middle income and high-income countries and the fact that these countries are also included for the most part in other studies including that by the McKinsey Global Institute.

Table 21: Aggregate Losses in Wealth from Gender Inequality in Earnings (US$ of 2014, Trillions)

	1995	2000	2005	2010	2014	2017(*)
	Global estimates by gender and gain from gender equality					
Human capital, men	301.2	349.1	371.6	405.5	453.2	486.2
Human capital, women	174.4	203.6	223.8	255.6	283.6	303.2
Counterfactual human capital, women	297.6	344.5	366.4	398.4	443.8	475.4
Increase in human capital	123.2	140.9	142.6	142.8	160.2	172.3
Loss as share of baseline total wealth	17.9%	17.8%	16.0%	13.9%	14.0%	NA
	Regional estimates of gain from gender equality					
East Asia & Pacific	34.2	35.8	37.7	42.1	49.9	54.8
Loss as share of baseline total wealth	24.5%	22.1%	20.8%	17.1%	16.6%	NA
Europe & Central Asia	32.4	36.3	37.2	38.8	41.6	43.6
Loss as share of baseline total wealth	14.3%	14.8%	13.7%	13.0%	13.3%	NA
Latin America & Caribbean	7.3	5.9	6.5	6.7	6.7	6.7
Loss as share of baseline total wealth	14.3%	10.5%	10.2%	8.8%	7.9%	NA
Middle East & North Africa	1.6	2.1	2.4	2.7	3.1	3.3
Loss as share of baseline total wealth	10.2%	11.8%	9.9%	7.7%	7.4%	NA
North America	43.4	55.1	51.3	43.3	47.2	49.9
Loss as share of baseline total wealth	18.8%	19.5%	16.3%	13.3%	13.5%	NA
South Asia	3.3	4.6	6.5	7.4	9.1	11.4
Loss as share of baseline total wealth	28.8%	32.2%	35.0%	29.4%	29.4%	NA
Sub-Saharan Africa	1.1	1.1	1.0	1.9	2.5	2.8
Loss as share of baseline total wealth	7.6%	8.8%	6.3%	9.8%	11.4%	NA
	Income groups estimates of gain from gender equality					
Low income countries	0.4	0.5	0.6	0.8	1.1	1.3
Loss as share of baseline total wealth	11.5%	13.5%	13.8%	14.2%	15.1%	NA
Lower-middle income countries	6.8	7.6	9.4	11.0	13.5	16.2
Loss as share of baseline total wealth	19.2%	20.7%	20.4%	18.1%	19.1%	NA
Upper-middle income countries	11.2	11.3	16.1	20.9	26.5	30.4
Loss as share of baseline total wealth	11.8%	10.0%	11.9%	10.4%	10.7%	NA
High income non-OECD	2.7	3.6	3.8	4.7	5.4	5.4
Loss as share of baseline total wealth	6.5%	8.6%	7.4%	7.1%	7.0%	NA
High income OECD	102.2	117.9	112.6	105.4	113.7	119.0
Loss as share of baseline total wealth	19.8%	19.8%	17.3%	15.2%	15.3%	NA

Source: Wodon (2018); see also Wodon and de la Brière (2018).
Note: Estimates for human capital wealth in 2017 are projections.

LOSS IN HUMAN CAPITAL WEALTH FROM UNDER-FIVE STUNTING

While gender inequality in earnings matters for all countries, under-five stunting matters more for developing countries, and especially low income countries where stunting rates are substantially higher. For stunted children and their families, the cost of stunting may not be primarily economic. But when considering the potential impact on human capital wealth of stunting due to gender inequality, the focus is on economic costs. Research suggests a loss in productivity associated with lower height as an adult (Strauss and Thomas, 1998; Caulfield et al., 2004; Dewey and Begum, 2011). Undernutrition could lead to economic losses equivalent to four to 11 percent of Gross Domestic Product in sub-Saharan Africa and Asia (Horton and Steckel, 2013). An experiment in Guatemala suggests that children who benefited from nutrition supplements were less likely to be stunted and had better cognitive abilities and higher wages in adulthood (Hoddinott et al., 2008, 2011, 2013a, 2013b).

BOX 15: COUNTRY ANALYSIS OF THE COST OF GENDER INEQUALITY: THE CASES OF NIGER, TANZANIA, GUINEA, AND UGANDA

Globally, the cost of gender inequality related to under-five stunting and population growth as well as budget savings are much smaller than the cost of gender inequality in earnings. This is because gender inequality in earnings affects women in virtually all countries including upper middle and high income countries, while the effect of reductions in stunting and population growth are much smaller in those countries. Yet in low income countries, impacts through these channels matter substantially. As an example, consider Niger where losses were measured as a share of GDP using similar approaches to those used in this study. Losses due to gender inequality in earnings were estimated at 23 percent of GDP (World Bank, 2018cb). Initially, the value of losses associated with the reduction in population growth is much smaller, but by 2030, these losses are equivalent to about a fifth of the losses due to inequality in earnings. If budget savings for the education sector from lower population growth are included, losses from population growth account for more than a fourth of the losses due to inequality in earnings. Finally, adding losses related to under-five mortality and stunting bring total losses for these channels to almost one third of the value of the losses due to gender inequality in earnings. Similar analysis was conducted for Tanzania (World Bank, 2019b), Uganda (Wodon et al., 2019), and Guinea (World Bank, 2019c) with broadly similar results.

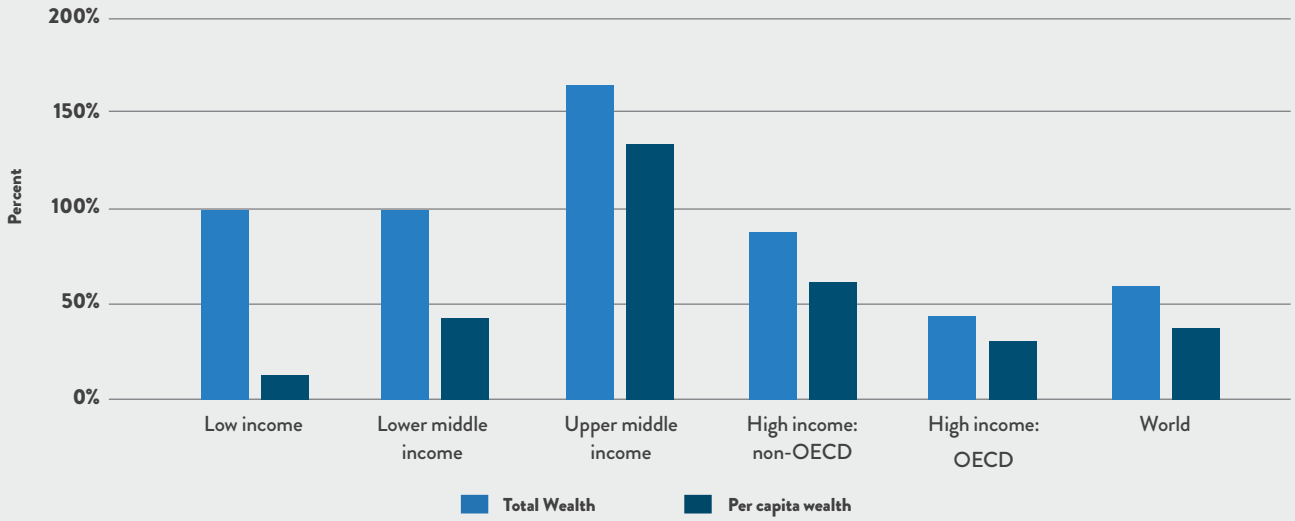
Various studies have considered the impacts and economic cost on stunting (Shekhar et al., 2016; Skoufias et al.. 2019; and Galasso and Wagstaff 2019). Here, to be consistent with the approach to costing based on human capital wealth, costs are based on losses in wealth from stunting. The estimation considers three variables: (1) the stunting rate for young children; (2) the reduction in stunting from that rate that could be achieved thanks to gender inequality as measured earlier; and (3) the estimated gain in earnings in adulthood and thereby human capital wealth that would result given estimates in the literature of the gains in earnings associated with preventing stunting in early childhood. Essentially multiplying these variables by prevailing levels of human capital wealth gives an estimate for each country of the impact of gender inequality on wealth through stunting. Based on this approach, the cost of gender inequality due to its impact on stunting for children under the age of five is estimated at US$71 billion in 2014 for 17 developing countries with a population of more than two billion people. This is much smaller than lost human capital wealth from gender inequality in earnings, but still substantial for the countries affected, and especially the individuals affected by losses in earnings in adulthood due to stunting in childhood.

LOSS IN WELFARE (TOTAL WEALTH PER CAPITA) FROM HIGH POPULATION GROWTH

Losses in welfare are meant in this study to represent losses in wealth per capita due to high population growth. To show how much population growth matters in low income countries, consider Figure 11 which compares growth in total wealth between 1995 and 2014 with growth in wealth per capita for countries classified by income categories. The difference between growth in wealth and in wealth per capita is population growth. While total wealth increased in most countries over the last two decades, per capita wealth did not. It grew fastest in middle-income countries, but due in large part to high rates of population growth, gains were smaller in low income countries. The growth in wealth was not sufficient in some of these countries to keep up with population growth, making it harder for those countries to reap the benefits of the demographic dividend.

Gender inequality has a large potential impact on lifetime fertility and population growth, both directly and through a reduction in child marriage and early childbearing. In 16 countries for which simulations were carried out with

Figure 11: Changes in Total and Per Capita Wealth by Income Status, 1995 to 2014



Source: Lange et al. (2018b).

demographic projection tools, the average reduction in population growth from gender equality was estimated at -0.26 percentage points. The reductions in annual population growth rates are however different depending on which country is considered. In India, the largest of the countries, the reduction was smaller because the country has already gone through much of its demographic transition. For perspective, India's annual population growth rate is currently at 1.2 percent per year, versus more than three percent per year for some other countries like Niger. How much is this worth in terms of human capital wealth per capita? In the medium term, since children who would not be born today would be adults only at the end of the period for the simulations (2030), there is no reduction over the time horizon in the labor force versus the business as usual scenario. Lower population growth then results in an increase in human capital wealth per capita since the denominator (population) becomes smaller while the numerator (human capital wealth) does not change (it could actually increase if lower fertility rates lead to higher labor force participation by women).

If gender equality could be achieved, the first year benefit from lower population growth is valued at US$80 billion for 16 developing countries with a population of 2.3 billion people. Additional benefits would accrue in subsequent years. Over time, gains would grow rapidly, ultimately rivalling gains from gender equality in earnings in those countries. However, in comparison to the cost of gender inequality in earnings globally, gains related to population growth are smaller because the countries that would benefit from substantial reductions in population growth have much lower estimates of total wealth than upper middle and high income countries where impacts on population growth would be small. Still, while losses from higher population growth due to gender inequality for women would initially be quite smaller than losses related to women's earnings, these losses would be far from negligible and would increase over time in countries with high population growth.

BUDGET COSTS FROM HIGH POPULATION GROWTH

Another benefit from reduced population growth in countries with high fertility rates is reduced pressure for state budgets to provide services to the population, or an ability to provide higher quality services. As an illustration, consider results of simulations for education budgets. In the first few years after achieving gender equality, there is no impact on the size of new cohorts of children entering primary school, but soon thereafter there is a reduction in cohorts. This pattern is observed with a lag for secondary schools too. By reducing the size of new cohorts of children going to school, achieving gender equality may provide significant savings or enable investments in quality. To estimate those savings, assumptions are needed for trends in enrollment and

completion rates, the efficiency of the education system, recurrent unit costs at various levels of schooling and how these may change over time with economic growth and improvements in standards of living (these assumptions themselves depend on parameters such as teacher salaries and pupil-teacher ratios), and the cost of capital investments for school construction. The market share of private schools also plays a role in the estimation. Fortunately, a costing model prepared for the 2015 Education for All Global Monitoring Report can be used for the analysis (Wils, 2015). The costing model was developed to estimate total costs and external finance needs to reach full primary and secondary education in low- and lower-middle income countries.

Based on simulations for 16 countries, cost savings for education budgets from lower population growth under a scenario of gender equality could reach US$27 billion annually by 2030. This would represent 7.4 percent of the expected education sector budgets in those countries by 2030. The budget savings start from a low base and increase over time for three main reasons. First, the impact of achieving gender inequality on population growth is small in terms of the reduction in the population of children in age of schooling in the first few years, but rises over time. Second, the counterfactual scenario includes rising budget expenditures meant to cover the cost of progressively achieving universal secondary education and thereby progressively reducing the share of children out of school. Finally, the unit costs for each child to be in school also increase alongside economic growth in the countries. These three factors are the main reasons why budget savings over time become larger. Note that achieving those budget savings would entail initial costs since for example to end child marriage – one of the components of the simulations on gender equality, interventions are needed to keep girls in school, leading to costs for states and out-of-pocket and opportunity costs for parents. These costs would offset some of the benefits from the reduction in the size of future cohorts of students thanks to lower population growth.

The broader message here is that many countries are not investing enough in their people. Reducing gender inequality has a role to play in enabling better and more investments in people. Women should have the ability to manage their fertility. This is unfortunately often not the case as suggested by unmet needs for family planning. At the national level, by contributing to high fertility and population growth, gender inequality may put pressure on the quality of the services provided by governments to their population. This is because higher population growth makes it necessary to spread budget resources more thinly, including to provide basic education to ever larger cohorts of students. If annual rates of population growth were lower, resources might become available to invest in higher quality services. Savings resulting from lower population growth could then be reinvested in higher quality services, which themselves would probably contribute to reducing gender inequality.

BOX 16: AVOIDING DOUBLE COUNTING IN ESTIMATING COSTS

The four costs highlighted in this section – losses in human capital wealth from gender inequality in earnings, losses due to high levels of population growth due to both welfare losses and budget costs for states of providing basic services, and losses related to stunting do not "double count" as costs as there is no overlap between them. Other types of costs could be documented in future work, and in some cases have been documented in past or on-going work. One example is the costs associated with gender-based violence which affects mostly women. Those cost can represent a large share of GDP, or alternatively human capital wealth. One important point however is that policy makers and advocates need to be careful when combining different costs to avoid double counting. For example, the cost of gender-based violence in terms of lost earnings for women due among others to injuries or other forms of trauma is already implicitly accounted for in the analysis when looking at gender inequality in earnings. By contrast, costs related to health spending because of gender-based violence are not accounted for in our analysis.

POLICY OPTIONS FOR GENDER EQUALITY

There is a major difference between developed and developing countries in the economic costs generated by gender inequality. In developed countries, costs related to gaps in labor market earnings tend to dominate, given that other costs (as measured in this study) tend to be small since the countries have lower levels of population growth and under-five stunting, among others. By contrast, in developing countries, while costs associated with gender inequality in earnings are also high, costs related to population growth and under-five stunting are far from being negligible, and in some cases may exceed costs related to gender gaps in earnings, at least over a sufficiently long period of time. The implication is that in developed counties interventions to reduce the costs of gender equality may focus in large part on labor market earnings and other factors affecting income levels. However, in developed countries, and especially in low income countries, high rates of population growth as well as poor education, health, and nutrition outcomes must be tackled as well. This is why in low income countries, investments in adolescent girls are so important, including to improve educational attainment, reduce child marriage, and prevent early childbearing.

The main objective of this study is to estimate selected economic impacts and costs of gender inequality. But it is also useful to provide guidance on investments that could help reduce gender inequality. The guidance provided is not meant to be comprehensive, nor exhaustive. Since gender inequality affects girls and women in virtually all aspects of their life, a wide range of interventions could be implemented. To keep this section relatively short, the focus is on three types of investments along a simple life cycle model: (1) Investments in early childhood development to reduce the impact of gender inequality as experienced by mothers on their young children; (2) Investments in adolescent girls to delay marriage and childbearing while also improving education opportunities, which would help reduce population growth; and (3) Investments in adult women to improve employment and earnings opportunities and thereby increase human capital wealth.

This categorization in three buckets of policies for gender equality corresponds to three distinct periods in life is for expository purposes. In practice the various types of polices have multiple impacts and rationales. For example, interventions in early childhood contribute to higher labor productivity later in life, as does educational attainment for girls in adolescence (for a more comprehensive look at policies related to the life cycle in the context of employment and productivity, see World Bank, 2010 and World Bank, 2019d). Similarly, while some of the interventions in early childhood relate to the availability of family planning with implications for fertility and population growth, delaying child marriage and early childbearing also contributes to lower fertility, as do employment opportunities for women among others by shifting the trade-off between so called productive and domestic work. And finally, while interventions in early childhood clearly matter for young children, so do interventions for adolescent girls and adult women.

Focus on a subset of investments to achieve gender equality in this study does not mean that other types of investments are not important, nor needed. Many other types of interventions could be advocated, and a few examples of such interventions will be provided through boxes in what follows. But because the three types of

investments highlighted here are related directly to the three large economic costs of gender inequality noted earlier, these are the investments considered in this study. In addition, the study calls for targeting high prevalence areas for gender inequality or some of its manifestations when implementing interventions, simply because under limited resources prioritization is needed, and for the preparation of diagnostic and strategies to achieve gender equality. Those two additional topics are also briefly discussed in subsequent sections.

INVESTMENTS IN YOUNG CHILDREN

In some countries, gender inequality manifests itself from early childhood or even before. Extreme cases include the issue of "missing girls", which refers to girls who may never be born due to parental preferences for boys. After birth, girls may still be at a disadvantage if they do not benefit from the same investments and protections as boys. But more importantly for this study, even if differences in indicators such as under-five mortality and stunting tend to be small between boys and girls, the more important issue is that gender inequality affects outcomes for mothers, and this in turn affects their children's well-being, whether they are boys or girls. In other words, in matters of early childhood development, the issue of gender inequality considered here is less related to gender gaps in indicators than to how gender inequality may affect boys and girls alike. As shown in the analysis of the impacts of gender inequality, factors such as high rates of child marriage and early childbearing and low educational attainment for girls lead their young children to be at higher risk, among others, of under-five mortality and stunting. Some of the interventions that can help reduce such risks target young girls and mothers, and they will be discussed in the next sections. But a range of interventions can also be implemented at the level of children – both boys and girls, to ensure that they have a good start in life, and to prevent negative effects from gender inequality. In addition, gender stereotypes are learned at a young age, including through differences in the way boys and girls are taught (or parented). This may have impacts later in life for a confidence, persistence, perspectives, and bias.

Early childhood development (ECD) is a complex multi-dimensional process. The various aspects of young children's development – including their physical, socio-emotional. and cognitive development, are all interrelated (Shonkoff et al., 2012). Neurological studies show that synapses (structures that permits neurons in the brain to pass signals to other neurons) develop rapidly in the first 1,000 days of a child's life. Sensory pathways for vision and hearing develop first, followed by language skills and higher cognitive functions (Nelson, 2000). These synapses form the basis of cognitive and emotional functioning later in life. As a result, inadequate development, for example due to poor nutrition, may not only lead to poor physical growth, but it may also impede brain development, with negative impacts later in life on academic achievement as a student and future productivity as an adult. This provides a strong economic case for implementing nutrition and other interventions such as early stimulation to improve ECD outcomes (Wodon and Shekhar, 2016).

There is an emerging consensus that investments in ECD not only should be a priority to enable children to reach their full potential, but also have high economic rates of returns (Carneiro and Heckman, 2003; Heckman and Masterov, 2007; Engle et al., 2011; Denboba et al., 2014), particularly when compared to investments made at later stages in life. As noted by Black et al. (2017), investing in young children is one of the best investments that countries can make. A child's earliest years present a unique window of opportunity to address inequality (including gender inequality), break the cycle of poverty, and improve a wide range of outcomes later in life. Brain research suggests the need for holistic approaches to learning, growth, and development, recognizing that young children's physical and intellectual well-being, as well as their socio-emotional and cognitive development, are interrelated. By the end of early childhood, young children should be healthy and well-nourished; securely attached to caregivers; able to interact positively with families, teachers and peers; able to communicate in their native language; and ready to learn throughout primary school. In contrast, early gaps in childhood development jeopardize a child's capacity to reach these important milestones. Advances in biological and social science evidence provide a wealth of resources to inform innovative strategies that promote optimal child growth and development. Programs that combine services (such as nutrition and psychosocial stimulation) can have especially large beneficial impacts and rates of return. Unfortunately, most countries fall short in their delivery of essential services for young children and their families. The challenge is to develop scalable, cost-effective models for delivering these services in low- and middle-income countries.

Several agencies have suggested frameworks to address the needs of young children. A recent series on ECD in the Lancet draws on the concept of nurturing care (Black et al., 2017). UNICEF had long emphasized the need for multiple interventions for ECD, including basic health, nutrition, education, and protection services. The World Health Organization (WHO) has established guidelines for each developmental phase, including pregnancy, postnatal, baby, infant, and young child health care. The Partnership for Maternal, Newborn and Child Health has provided policy-makers with specific information on the essential health interventions to address the main causes of maternal, newborn, and child deaths. At the World Bank, Denboba et al. (2014) suggested a list of 25 interventions considered as essential for young children. These interventions can be delivered through five integrated packages at different stages in a child's life: (i) the family support package, which should be provided throughout the ECD period, (ii) the pregnancy package, (iii) the birth package from birth to six months, (iv) the child health and development package, and (v) the preschool package. In reference to these 25 essential interventions, two are especially important for this study's focus on gender inequality: (1) planning for family size and spacing, and (2) support to families and especially women related to the care economy.

- **Family planning and birth spacing.** A woman's ability to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy, and thereby on her children. Planning for family size and spacing allows parents to anticipate and attain their desired number of children and the desired spacing and timing of their births. This can be achieved among others through access to modern contraceptive methods and the treatment of infertility, but in many settings programs to improve sexual and reproductive health knowledge among adolescent girls and young mothers can also be highly beneficial.

- **Reducing, redistributing, and recognizing unpaid work and care.** Women spend substantially more time in unpaid home-based work than men, and consequently less time in market work. A substantial share of home-based work is allocated to taking care of young children. Reducing unpaid work for women would free time for market work or other activities. Various types of policies can help in that regard and are discussed below. But within the area of ECD, a key policy to improve gender equality and reduce the costs of gender inequality should be to promote opportunities for a double redistribution of care work for young children, not only within households from female to male members, but also from households to public and private service providers through the provision of quality and affordable care services. Not all women might take advantage of such service provision if they prefer to stay at home to take care of their young children, but opportunities to use such services should be provided.

- As noted by Devercelli and Beaton-Day (2020), while childcare is an issue that impacts all working parents, it is particularly important for women's employment. Lack of affordable childcare often keeps women out of the workforce or prevents them from reentering the workforce after childbirth. It also limits the quality of employment and income earning opportunities that women can pursue. This can have a wide range of negative impacts, including on the family's economic security, gender equality and empowerment, and business and economic growth. Aside from reducing family income, family resources may also be allocated in different ways when women do not have control over their own incomes. Finally, when women exit the workforce, firms lose valuable employees, resulting in increased costs related to attrition and reduced business productivity, as well as missing out on the benefits of a more diverse workforce.

INVESTMENTS IN ADOLESCENT GIRLS

Patterns of gender inequality become salient during adolescence, as evidenced by child marriage, early childbearing, and low educational attainment for girls in comparison to boys in low income countries. Investing in adolescent girls could generate substantial economic benefits for three main reasons: (1) Earlier investments tend to have a persistent positive impact throughout women's lives. If a girl completes secondary education and avoids early marriage, the benefits endure throughout her life; (2) The cost of interventions for girls in adolescence or even earlier tends to be lower than the cost of interventions later in women's life cycles; and (3) Interventions targeted at girls at a formative age may be more successful in influencing values and behaviors, not only for the girls directly targeted but for the community. If women are targeted later in life, returns on

the investment may be lower, as it will become increasingly difficult for them to fully benefit from new opportunities.

While interventions for women at a later point in the life cycle are also needed, adolescence is a critical period when investments are likely to generate the highest returns. These returns come not only from the higher earnings that girls will enjoy in adulthood, but also from the reduction in fertility and population growth that would follow in countries where population growth remains a barrier to gains in standards of living. To eliminate child marriage and early childbearing and to enable all girls to complete their secondary education and learn the skills they will need while in school, some general conditions for schooling and learning must be met. Specific interventions to delay marriage and childbearing and improve sexual and reproductive health knowledge among girls also show promise, including for reducing high fertility rates. Both are considered.

GENERAL CONDITIONS FOR SCHOOLING AND LEARNING

Given that one of the best ways to end child marriage and early childbearing is to keep adolescent girls in school, measures are needed to improve access to education and learning while in school. Multiple entry points can be considered. Among them are (1) reducing the disadvantages confronting girls in remote communities, at times due to poor targeting of government resources; (2) creating a more inclusive school culture for girls; (3) providing girls with role models, such as female teachers; and (4) raising the returns to secondary school completion for women through local employment opportunities. More generally, there is a need to improve basic general conditions in education systems especially in low and lower-middle income countries so that all girls remain in school. Several such conditions are worth emphasizing here:

- **Ensuring adequate schooling infrastructure.** Secondary education completion rates for girls are low in many countries in part because there are just not enough secondary schools. Developing a school construction strategy to bring schools closer would help with ensuring girls' ability to go to school and their safety on the way to school. School construction can reduce transport costs in areas with extremely low schooling density, with particularly positive impacts for girls, as recent evidence from Afghanistan (Burde & Linden, 2013) and Burkina Faso (Kazianga et al., 2013; Sawada et al., 2016) attests. Schools also need to provide access to water, latrines, and hygienic facilities, which may be particularly important for adolescent girls. Where schools cannot be constructed in locations that meet the needs of communities, providing transportation to school is an alternative. Finally, it is essential to ensure that girls do not suffer physical, sexual, or other harassment at school or while travelling to and from school (see more generally Abramsky et al., 2014, on gender-based violence and how to reduce it in Uganda, and Mgalla et al., 1998, on a guardian program in primary schools in Tanzania with female teachers elected by colleagues and trained as guardians for female students).

- **Ensuring that the education system delivers effective learning outcomes.** In many countries in Africa (Bashir et al., 2018), and more generally in the developing world (World Bank, 2018b), student learning outcomes, as measured by national and international student assessments, are poor. This needs to be addressed through investments to ensure not just greater access but also improved quality. Priorities in this area depend on each country, but they may include increasing the number of teachers in line with standards and emphasizing subject areas with acute shortages (e.g., mathematics and science). Better in-service teacher training is often needed, and teacher awards programs can help encourage reductions in gender gaps in school performance when such gaps are observed. Providing in-service teacher training to challenge gender differences in teacher expectations and establishing teacher mentors to support girls can also help. Guidance on these and other teacher policies is available in Beteille and Evans (2018) and more generally on improving skills in Africa (World Bank, 2019d).

- **Ensuring the participation of girls.** Schooling must be affordable for families. Affordability refers not just to the direct costs of participation in secondary education, but also to opportunity costs. In many low-income countries, these costs remain high for the poor, especially for girls. Fee free public education at the secondary level can be a major step forward, yet providing secondary education free of tuition and other direct costs may not be enough to ensure the participation of all school-age children, particularly girls (see Koski et al., 2018). Conditional or unconditional cash transfer programs can help when coverage is sufficient to reach the extreme poor. They can be used to encourage formal schooling or to open non-formal pathways to continuing one's education. Also of interest are programs such as those run by Camfed to cover the direct and indirect costs of schooling for girls while also supporting community-led initiatives to engage parents and train teacher mentors, staff, and parents to improve educational quality through low-cost educational resources (see for example Alcott et al. 2017; Sabates et al. 2018).

- **Ensuring that social norms are progressively changed.** In addition to policies targeting the education system, broader efforts are also likely to be required to progressively change social norms that perpetuate gender inequality. Although an extensive discussion of issues related to social norms is beyond the scope of this study, it must be recognized that child marriage, early childbearing, and low educational attainment for girls are part of deep-seated patterns of gender inequality (Klugman at al. 2014). But at the same time, changing patterns of child marriage, early childbearing, and low educational attainment for girls through a variety of policies and incentives may well be one of the best ways to progressively change existing social norms.

BOX 19: IMPROVING EDUCATIONAL ATTAINMENT AND LEARNING FOR GIRLS

Several reviews consider interventions to improve education for girls and empower them, including Unterhalter et al (2014), Sperling and Winthrop (2015), Botea et al. (2017), Evans and Yuan (2019), and Wodon (2020). For example, Unterhalter et al. (2014) assess the impact of interventions promoting girls' education specifically through (1) resources (such as cash transfers) and infrastructure; (2) improved institutions responding to student needs; and (3) changed social norms, especially for those affecting the most marginalized. The review summarized the impact of different interventions on three outcomes: participation; learning; and empowerment. For each type of intervention and outcome, the evidence on the likelihood of impact is considered strong, promising, limited, or weak. For participation, the evidence for the impact of cash transfers, information about the potential employment returns to education, and the provision of schools in underserved and unsafe areas is strong. This was also true for a range of interventions related to teacher training, group learning, measures to promote girl-friendly schools, and learning outside the classroom, such as through tutoring. Group learning, programs for learning outside the classroom, and scholarships linked to student performance were also found to have impacts on learning. The evidence for the impact of interventions on empowerment was generally weaker.

Evans and Yuan (2019) note in particular that some past efforts to synthesize evidence on how to improve educational outcomes for girls have focused on interventions targeted to girls. However, non-targeted interventions benefitting both girls and boys may also improve girls' education. Looking at the evidence from a large set of interventions, the authors suggest that to improve both access and learning for girls, girl-targeted interventions may not necessarily deliver better results than interventions that could benefit boys as well as girls and are thus not specifically targeting girls. For example, cash transfer programs may be directed to households as opposed to specifically girls, or interventions for improved pedagogy in the classroom need not necessarily be gender-specific.

BOX 20: THEORIES OF CHANGE FOR INTERVENTIONS TARGETING ADOLESCENT GIRLS

Life skills and SRH knowledge: By increasing knowledge, life skills can raise girls' awareness of risks associated with becoming pregnant early and increase their desire and ability to avoid early pregnancies through family planning. Through such channels, life skills may lead to better health outcomes for the girls and their children. By increasing girls' confidence and self-esteem, life skills may also help expand their aspirations, which may heighten their motivation to delay marriage and childbearing. Finally, life skills can increase the communication and decision-making skills of young women and increase their abilities to negotiate their marriage and childbearing preferences. However, while life skills and SRH knowledge may empower girls, they may not be sufficient to delay marriage and childbearing if social norms curtailing agency are not also addressed.

Economic opportunities: Programs to increase young women's earnings may increase their ability to plan and improve their marriage and childbearing decisions in three ways: (1) Improvement in a woman's ability to make an economic contribution expands her role beyond that of sex and reproduction. This can increase a girl's desire to delay marriage or childbearing. The transformation of girls from economic liabilities into assets in the eyes of their communities and families can also alleviate the external pressures on them to marry or have children early. (2) The loss in earnings associated with childrearing is an opportunity cost that may increase women's desire to limit or space births and to exercise reproductive control. (3) Increased earnings may supplement a young woman's bargaining power within the household and allow her to effectively exercise reproductive control by negotiating delays in sexual debut or marriage, and to better negotiate the terms of sex, such as use of contraceptives. Creating income-generating opportunities for women can also contribute to empowerment by widening a woman's personal choice and control over SRH outcomes.

Incentives for schooling or delaying marriage: In many communities, the economic, cultural, and social environment does not offer adolescent girls viable alternatives to marriage. Once girls drop out of school, possibly because of the school's poor quality or high cost, parents may find it difficult to identify any option other than marrying off their daughters. In such communities, providing better-quality and affordable primary and secondary education may be one of the best ways to delay marriage and childbearing. Programs to keep girls in school may also lead to tipping points in communities that make it easier for more and more girls to stay in school and thus delay marriage. A few interventions have also aimed to delay marriage by providing financial incentives conditional on not marrying early, with additional schooling often a benefit.

Source: Botea et al. (2017).

INTERVENTIONS TO DELAY MARRIAGE AND CHILDBEARING AND IMPROVE SEXUAL AND REPRODUCTIVE HEALTH

While it is essential that countries promulgate appropriate policies including laws to facilitate the elimination of child marriage and reduce the risk of early childbearing, also required are specific strategies and interventions to empower girls, including through appropriate life skills and knowledge of sexual and reproductive health. Economic incentives may also be needed so that girls can afford to remain in school, return to school if they dropped out, or expand their livelihood opportunities and that of the household in which they reside if they cannot return to school. To facilitate selection of such interventions, this section summarizes international evidence related to three types of interventions for adolescent girls: (1) programs that provide girls with life skills and reproductive health knowledge; (2) programs that expand girls' economic opportunities; and (3) programs designed to ensure that girls remain in school or that

enable them to return to school. Each type of program is however based on a different theory of change (Box 20). The summary of findings from the literature provided here is based on a review of almost 40 such interventions with robust evaluations by Botea et al. (2017).

To qualify for inclusion in the review, interventions had to (1) target girls aged 10–19, either exclusively or as part of a larger group; (2) equip girls with life skills and sexual and reproductive health (SRH) knowledge, economic opportunities, or educational opportunities; (3) demonstrate results in terms of improving the health of young women, especially SRH, or delaying marriage or childbearing; and (4) have been tested in a developing country, usually in Sub-Saharan Africa but also in other low-income settings such as Bangladesh or parts of India (see also Kalamar et al., 2016, for another review of the evidence focusing on programs aiming to delay marriage). Key findings for the review are as follows:

- **Girls' empowerment.** Some interventions emphasize empowerment of girls by providing them with life skills and SRH knowledge, among others through "safe space clubs". The clubs convene girls under the guidance of a trusted adult mentor at a specific time and place. The approach was pioneered by BRAC in South Asia and by the Population Council in Africa and Latin America. The clubs have proven effective when implemented well. By combining opportunities to socialize and have fun with access to mentors, the clubs are attractive to girls and offer a platform for other services. They can be used to provide SRH knowledge and improve life skills, including critical thinking and problem solving, negotiation, and communication (for example within a household). The clubs can also boost self-awareness and self-esteem, and they may also facilitate delivery of cognitive skills such as basic literacy and numeracy, or basic business skills. These programs have helped improve girls' knowledge of SRH and behaviors. Outcomes have included increases in girls undergoing HIV testing or counseling; greater use of modern contraception and family planning; a reduction in the desire for FGM for daughters; a reduced risk of intimate partner violence when programs also reach out to men; higher self-esteem; and gains in specific skills. However, without additional supportive interventions, safe spaces alone may not delay marriage and childbearing (perhaps because that may not have been a primary goal for a club). Therefore, it may be best to combine safe spaces with measures to improve livelihood opportunities or offer incentives to remain in school, which are usually more effective in delaying marriage and childbearing.

- **Employment Opportunities.** This category of programs emphasizes both empowering girls, often through safe spaces, and providing livelihood opportunities. These programs are particularly appropriate for girls who are not in school and would otherwise have no income-generating skills. Two groups of interventions are distinguished: (1) livelihood interventions and (2) interventions to improve financial literacy and access to financial services. Impacts in terms of delaying marriage and childbearing generally (though not always) tend to be larger than for the life skills/SRH knowledge programs alone. The programs have some success in increasing earnings, employment, or savings of girls. Several programs also result in increased use of modern contraceptives and improved SRH knowledge, which may delay childbearing. Some have also succeeded in delaying age at marriage and reducing teen pregnancies. For example, the BRAC Uganda Empowerment and Livelihoods for Adolescent Girls had the following impacts: (1) The likelihood of girls engaging in income-generating activities went up by 32 percent; (2) Among girls sexually active, self-reported routine condom use went up by 50 percent; (3) Fertility rates went down by 26 percent; and (4) Reporting of unwanted sex plunged by 76 percent. There were also reductions in teenage pregnancies and child marriage, and a shift in community gender dynamics (Bandiera et al. 2014; Buehren et al. 2016). Overall, adding a livelihood dimension to life skills and SRH knowledge programs may help delay marriage and childbearing. The focus on economic opportunities may also help to ensure the regular participation of girls in the programs.

- **Incentives to Keep Girls in School.** This type of interventions aim to keep girls in school, enable them to return if they have dropped out, or directly delay marriage. Quite a few of these interventions have had positive impacts (Kalamar et al. 2016), including for delaying marriage or childbearing. While most of the programs are designed to keep girls in school, some enable girls who dropped out to return to school. Also effective are conditional cash transfers to incentivize girls' schooling, promote health, and support families

during shocks. Across more than 20 impact evaluations of cash transfers programs around Africa (from Burkina Faso to Zimbabwe), all but one showed significantly improved outcomes in education (Evans and Popova, 2017). Such transfers have been introduced in more than two dozen low-income countries. Cash transfers without conditions and income support programs have also had positive outcomes, such as reduced child labor, expanding schooling, and enhancing childhood nutrition. While not all programs succeed everywhere, the evidence is convincing that in comparison to the other two types of programs reviewed above, those focusing directly on schooling for girls, or in some cases using financial incentives to delay marriage, may be more successful in delaying marriage and childbearing.

- **Summary for targeted Interventions.** The three types of interventions are not an exhaustive list. To improve girls' educational attainment, additional interventions may also be needed. These interventions were selected because there is evidence that they help improve SRH knowledge and delay child marriage and early childbearing. The programs are also not mutually exclusive; implemented together, they can complement each other. While some programs are better than others in delaying marriage and childbearing, all three categories of programs have significant benefits and should be considered when formulating a strategy to invest in adolescent girls.

INVESTMENTS IN ADULT WOMEN

Two main factors lead to gender inequality in human capital wealth. First, men have higher labor force participation rates than women and they tend to work more hours in paid work. Women tend to work more hours than men, but a larger share of this effort is dedicated to unpaid work (household chores, care and work on household farms or in household enterprises), hence they tend to have lower earnings. Second, men tend to earn more than women per hour of work. Despite progress towards equality in educational attainment between boys and girls, part of the gender wage gap for adults is also due to differences in educational attainment due to deeply entrenched social norms. But other factors also play a role, including gender discrimination in labor markets and occupational sex segregation, also in part due to social norms. While gender gaps in education have been reduced in recent decades, these other factors leading to gender gaps in earnings remain prevalent.

A woman's earnings depend on her human capital, work experience (including firm-specific human capital), and the demand for her labor (which could be gender-biased). Women's labor force participation is also affected by labor market, fiscal, and family policies as well as employer policies. Across countries, additional factors include political ideology, religion, and culture, stages in economic development, and industrial mix with different relative demands for female labor in the private informal, private formal, and public sectors. Harnessing the returns from increased female labor force participation into activities generating more income means levelling the playing field and addressing the reallocation of time between paid employment and other activities as well as persistent and pervasive gender differences in productivity and earnings across sectors and jobs.

Men's and women's jobs differ across sectors, occupations, types of jobs, and firms as multiple factors lead to gender segregation with important implications for gender gaps in earnings (Goldstein et al., 2019). The World Development Report on gender (World Bank, 2012) posited that these differences stemmed from three main factors: (i) unequal distribution of time use and care responsibilities between men and women and between households and public/private service provision; (ii) unequal access to and control over productive assets (particularly land, credit, insurance and savings but also key skills); and (iii) market and institutional failures (access to information and networks, legal and fiscal impediments, restrictive social norms). Policies related to these three main factors are outlined in Table 22 from Wodon and de la Brière (2018). Differences in these areas may affect all women (wage workers, farmers, and self-employed workers/entrepreneurs) and may reinforce each other and lead to productivity trap. This is costly not only for women, but also to their household, their community, and society as estimates of losses in human capital wealth from gender inequality demonstrate. In addition, these differences represent a serious disincentive to investments in the women of tomorrow.

Table 22: Examples of Interventions to Address Constraints on Women's Paid Work

Constraints/Type of work	Wage employees	Farmers	Entrepreneurs/Self-employed
Time use constraints			
Basic Infrastructure	Access to basic infrastructure (cooking energy, water, electricity) Access to safe and affordable transportation		
Childcare	Access to quality, affordable, publicly sponsored or employer-provided childcare		
Laws & technology	Workplace flexibility in-cluding parental leave	Time saving technology	Time saving technology
Access to productive assets			
Land	-	Joint titling	-
Skills	Bundled training (technical and managerial) including socio-emotional skills (persis-tence), and asset-specific training		
Micro-credit (self-employed)			In-kind and cash grants
Credit (Small & Medium Enterprises)	-	Alternative collateral: moveable assets, payment history, psychometric tests	
Digital finance/savings and pay-ments systems	Direct payments to accounts		Individual saving accounts
Other financial services	Bundled financial services for risk management including insurance products for business and health needs among others		
Banking	Mobile/web banking and simplification of KYC (Know your customer) rules		
Market and institutional failures			
Information	Payment transparency Workers' rights	Innovations in rural extension. Engagement in value chains	Returns to traditionally male-dominated sectors
Social capital	Expanding social networks: mentorship and sponsorship, role models		
Legal frameworks	Removing gender differences in business, labor and family laws, enforcing existing laws supporting gender equality		
Taxation	Individual income tax	-	Differential VAT
Social norms	Preventing and mitigating gender-based violence Building aspirations and self-confidence		

Source: Wodon and de la Brière (2018).

ADDRESSING TIME USE CONSTRAINTS

Virtually every society has a division of labor based on gender norms – typically with women specializing in reproductive work and men in productive work. A recent review of time use surveys (Rubiano and Viollaz, 2018) shows significant differences in the way women and men allocate their daily time between leisure, unpaid work (household chores and child/elderly care) and market work. Women spend on average 5 hours in unpaid work and 2.3 hours in market work while men spend 5 hours in market work and 1.9 hours in unpaid work. Similar findings have been found in previous work using time use data for sub-Saharan Africa (Blackden and Wodon, 2006). Recogniz-ing, reducing, and redistributing unpaid work would thus free a significant amount of time for women to participate in market work.

At home, access to basic infrastructure services (water, electricity, energy), as well as child and elderly care services can free women's time. The role of infrastructure in freeing productive time for women has long been recognized (Estache and Wodon, 2014). Rural electrification for example contributes to women's economic empowerment by increasing the length of the work day, reducing time for housework and fuel collection, and providing home-based business opportunities. This is especially the case when gender biases in the family and local economy are also addressed, given interdependence in women and men's time allocation decisions (van de Walle et al., 2013). The same is true for access to water. In Morocco, a project aimed to reduce the burden of girls traditionally involved in fetching water to improve their school attendance. In the project's areas, girls' school attendance increased by 20 percent in four years (World Bank, 2003).

For child care, Mateo Díaz and Rodriguez-Chamussy (2016) and Reimo et al. (2017) review some of the evidence on the impact of providing child care and early education services. They find that the provision of these services in Latin America increases female employment by 10 to 30 percent. Public provision of affordable and quality child care is especially important for women's labor force participation, but there is also a role for employer-supported childcare provided that the costs of provision do not affect negatively women's employment opportunities. Partnerships and collaboration between the public and private sectors and civil society organizations can help in this regard (International Finance Corporation, 2017).

Interventions that make it easier for women to get to work can also be beneficial. While women tend to be responsible for a disproportionate share of their household's transport needs, they tend to have more limited choices for mobility, in terms of mode and distance. A combination of inadequate mobility choices (including slower travel options and off-peak travel when frequencies are low) with more complex travel needs leads to slower travel speed and thereby smaller travel distances for women, resulting in limited access to economic opportunities and essential services. Studies in both developing and developed countries show a negative correlation between commuting time and women's participation in the labor force (see for example Black et al., 2014 for the United States). An increase of one minute in commuting time in metropolitan areas is associated with a 0.3 percentage point decline in women's labor force participation.

Security concerns also affect women's travel. Policy and program interventions to enhance security through physical infrastructure investments (lighting in stations, design of buses and trains, cameras and alarm systems), developing and testing new security reporting and monitoring tools (with mobile technology and witness bystander interventions), and information measures to foster behavior change (for example through education campaigns and increased law enforcement) are all positive measures. On-going experiments in several countries (such as Brazil and Pakistan) as well as the development of alternative transportation modes (ride-sharing) should shed light on what works and what are the constraints. Ride hailing platforms like Didi and Uber also provide opportunities for women's employment, in terms of flexibility, mobility and personal safety, but discrimination remains (see Accenture and International Finance Corporation, 2018).

At work itself, parental leave, flexible schedules and mode of work, and legislation on retirement ages can all make a difference. As noted under the Women, Business, and the Law indicators (World Bank, 2018a), policies that help workers balance paid work and family responsibilities include parental leave (which can be taken by either parent). The opportunity for workers to return to their pre-leave work or employer increases labor force participation and helps workers retain firm-specific human capital. The so-called father's quota in Nordic countries provides an incentive for fathers to take their leave or lose it, and to share in the child care. Workplace flexibility, either through part-time work, flexible hours, compressed schedules ("flextime") or through tele-commuting/home-based work also help workers balance the demands of paid work and family responsibility. For both leave and flexible work arrangements, it is important to ensure the participation of both women and men and to calibrate the generosity of leave/flexibility to minimize potential downsides for women in terms of slower career progression or occupational segregation.

In many developing countries, flexibility is only available through the informal sector and women tend to be concentrated in those jobs, which are often the only jobs enabling them – at a high cost in foregone income – to balance income-generation and family responsibilities. In the formal sector, ensuring that women and men can work until the same (retirement) age is particularly beneficial for women who tend to have patchier market work histories and shorter employment spells than men, which means that their retirement income is lower. Earlier retirement ages for women can cast an additional penalty as do long vesting periods.

FACILITATING ACCESS TO PRODUCTIVE ASSETS

Especially in low income countries, women's employment is informal, with self-employment being the most common type of work, and a large share of women still work in the agricultural sector. Women farmers and entrepreneurs consistently produce less and generate less income than their male counterparts (World Bank and ONE, 2014, Campos and Gassier, 2017). This reflects both unequal access to inputs and lower returns to these inputs. For female farmers, access to, and control over good quality land are especially critical for agricultural investment and rural household welfare. Yet statutory and customary land tenure systems often disadvantage rural women, who are less likely to control land than rural men. Women's tenure insecurity

reduces their investments in their land, thus undermining their productivity. Strengthening women's land rights is key to addressing the issues undermining their productivity. For example, Rwanda is making joint ownership the default option in its land titling program, which is associated with greater productivity (Ali et al., 2014).

Also important is the acquisition of soft technical and managerial skills. For farmers, factors relating to land beyond access itself help explain the gender gap. One of these challenges relates to land size. In Ethiopia and Tanzania, women receive lower returns than men to an extra hectare of land. This could be due to lower quality of the land, but it could also be due to women's relative difficulty in managing/hiring farm labor or the application of other inputs across larger tracts of land.

Financial exclusion also remains a barrier for many women farmers and entrepreneurs. Micro-credit by itself is not sufficient for a transformative impact. As women are less likely to hold titles to their productive assets, they face higher hurdles to secure loans for lack of suitable collateral. Promising initiatives include the promotion of alternative collateral through moveable asset registries, the use of payment histories for services such as cell phones, and psychometric testing to assess lenders' risk (Buehren et al., forthcoming). In addition, as women face difficulties to keep business/farm and household finances separate, health insurance products help to avoid depleting working capital when responding to family health needs (Campos and Gassier, 2017).

Given their time constraints, women are also more likely to prefer bundled products including insurance and financial services (International Finance Corporation et al., 2015). Secure (private) individual savings accounts, including in the form of commitment accounts and liquid savings, have positive outcomes for women across countries, ages and activities. Women still have an unmet demand for those and for entrepreneurs, they help protect specific business funds. However, very poor women might be too poor to save without additional support (Buvinic and O'Donnell, 2016). Bundled services including a relatively large (in-kind) capital transfer, asset-specific training, technical assistance, a stipend for one to two years, and health information/insurance and life skills training have shown that they can help push very poor women out of poverty traps with positive economic outcomes and increased savings. One example is the BRAC Ultra-poor Graduation program (Banerjee et al., 2015). More generally, innovative approaches such as the Women Entrepreneurship Finance Initiative can advance women's entrepreneurship by increasing access to the finance, markets, technology, and networks necessary to start and grow a business.

Acquiring managerial and psychosocial skills is important for all women, but especially farmers and entrepreneurs. Women farmers may face additional hurdles than their male counter-parts in hiring and supervising labor, or in using inputs such as fertilizers and pesticides correctly. For entrepreneurs, recent evidence points to the importance of training combining soft skills (especially for young female entrepreneurs or in fragile and conflict-affected countries) and managerial skills together with grants. This seems to be more effective than just providing capital and technical skills. High-quality business management training of significant duration (6 to 12 weeks) can have positive outcomes for poor female entrepreneurs, with improvements in business practices, leading to increased sales, profits, and survival rates. Demand-driven job services (plus vouchers/subsidies to employers and child care/transport stipends for trainees) increase economic opportunities of young women, especially if they tackle discrimination and other barriers in the training and work environments.

SOLVING MARKET AND INSTITUTIONAL FAILURES

Market failures refer broadly to situations in which markets do not lead to optimal resource allocations. Institutional failures refer to institutions not functioning properly and therefore not achieving their missions. Both types of failures can be pervasive with potentially serious implications for gender inequality, as a few examples help illustrate.

Access to information to address occupational segregation and pay gaps can help improve gender equality. Women farmers tend to have less access to information about farming technology and methods as extension services are rarely designed to take their specificities (in terms of time availability, types of crops, or access to inputs) into account. Enabling women to shift to high value commercial crops shows promise in Africa. Access to information about potential returns for women in male-dominated fields can help female entrepreneurs cross over and shift sectors (Campos et al., 2015), provided they also get support from male mentors in the field and can withstand sexual harassment and barriers to access credit.

Access to social capital (networks, role models, and mentorship) also matters. Business associations, networks, mentors, and role models hold promise for both women entrepreneurs and farmers as they complement and reinforce the effects of interventions such as business training, cash transfers and agricultural extension. The complementarity seemingly arises from acquiring both information and social support, although we don't know whether these measures are similar or work differently. Self-help groups in particular foster increased solidarity between peers, independent financial decision-making, and greater respect for the women within their households and communities (Brody et al., 2015)

Another important area for reform is legal and fiscal frameworks. This includes labor market policies aimed at ensuring equal opportunities in the labor market such as anti-discrimination laws and the elimination of laws restricting women's labor force participation in some sectors. It also includes laws about access to capital and justice, as noted in Women, Business and the Law reports (World Bank, 2018a).

Finally, it includes policies targeted at advancing women to top positions (such as managerial and board diversity targets). These various laws are expected to positively influence women's labor force participation decisions and the type of employment they hold.

The structure of income tax policy creates a "second earner" penalty if the family is considered the unit of taxation or if dependent credits or allowances are eliminated when a spouse enters the labor market (Grown and Valodia, 2010). On the other hand, earned income tax credits provide an income subsidy for low-earner families and encourages women in those families to enter the labor force.

Ensuring safety and preventing gender-based violence at home, at work, and in public spaces is also essential. Appropriate laws are still lacking in many countries (Tavares and Wodon, 2018). There are also potential links between work and gender-based violence. Enhancing women's labor force participation can promote their empowerment and well-being, as well as the welfare of their children (since mothers often control more spending related to children). However, the empirical relationship between women's employment and domestic violence is less clear-cut, depending on whether husbands perceive their roles as breadwinners undermined (especially in case of unemployment or when the deviance from gender norms is too strong) and male co-workers perceive potential displacement from female employees or female colleagues as "unsuitable". The evidence is mixed: non-significant relationship in Jordan (Lenze and Klasen, 2017), positive in India (Amaral et al., 2015 with increases in kidnappings, sexual harassment, domestic violence and decreases in dowry deaths; Paul, 2016), and negative in the United States (Aizer, 2010 with the closing in the gender wage gap through exogenous changes in labor demand in female-dominated industries). The direct and indirect costs of gender-based violence to women and their children's productivity could amount to several percent of global GDP (Hoeffler and Fearon, 2014). More rigorous evaluations of the impacts of interventions for prevention, deterrence, and mitigation are needed in this area to find the approaches that will work best.

BOX 21: ENDING INTIMATE PARTNER VIOLENCE: LAWS AND SOCIAL NORMS

This study does not provide new empirical results related to violence against women, nor does it provide a systematic review of the evidence on programs to reduce such violence. Still, since violence against women is one of the manifestations of gender inequality, some pointers are worth providing.

Are countries protecting women legally against abuse? Analysis based on data from the Women, Business and the Law report conducted for 141 countries suggests that while most countries have laws on domestic violence and sexual harassment, there is still a large gap in overall protection and comprehensive laws (Tavares and Wodon, 2018). One in four countries have yet to adopt any legislation on domestic violence, while for sexual harassment that is the case in over one out of eight countries. Even where laws exist, this does not mean that women are well protected. Typically, existing laws are not comprehensive enough to account for multiple forms of violence (not only physical, but also sexual, economic, and emotional). Furthermore, when laws against sexual harassment exist, they do not cover many settings in which harassment may take place. Between 2013 to 2017, the share of countries with laws on domestic violence increased from 70.9 percent to 75.9 percent, but legal protection remains weak for sexual, economic, and emotional domestic violence. While laws may protect married individuals, they typically do not protect unmarried intimate partners. The share of countries with laws on sexual harassment increased from 83.7 percent to 86.5 percent. But again, not all risks are considered. For example, one in five countries do not have specific laws against sexual harassment in employment, and six in ten countries do not have laws against sexual harassment in education. For sexual harassment in public spaces, only one in five countries has laws.

When countries' populations are accounted for, this translates into large numbers of women unprotected by the law. For example, more than one billion women lack legal protection against sexual violence by an intimate partner or family member, while legal protection from domestic economic violence, which may result in a woman being deprived of the economic means to leave an abusive relationship, is not available for close to 1.4 billion women, with little progress for both measures over time. Estimates of the number of women lacking legal protection against sexual harassment in employment, education, and public places are at 359 million, 1.5 billion, and 2.2 billion respectively.

Beyond appropriate laws, interventions to end violence against women must tackle social norms. An emerging evidence base is becoming available[6] on what works especially in middle and high-income countries (WHO 2010; Paluck and Ball 2010; Jewkes 2014; Bourey et al., 2015, Tappis et al. 2016), but a few programs in low income countries related to HIV/AIDS and Village Savings and Loan Associations (VSLA) have been evaluated. These programs tend to work through small participatory workshops to challenge existing beliefs, or larger community campaigns to reinforce these efforts using street theatre, discussion groups, cultivation of change agents, and print materials. Some of these programs have resulted in small changes in attitudes/beliefs and reductions in IPV (Heise, 2011; Arango et al., 2014).

[6] The authors are grateful to Muthoni Ngatia and Diana Arango for summarizing some of the evidence.

Stepping Stones, a program implemented in more than 40 countries, uses participatory learning to build knowledge, risk awareness, and communication and relationship skills on gender, violence and HIV (World Bank, 2014). Evaluations suggest that men's self-reported perpetration of physical and/or sexual IPV was lower after participating in the program, although effects waned after two years (Jewkes et al., 2008). In addition, there was no difference in women's reports of IPV victimization. Self-reporting may have led to measurement issues, for example when awareness of the fact that IPV is unacceptable reduces reporting of IPV perpetration, or when a reduction in the stigma associated with being a victim of IPV increases women's willingness to report having experienced IPV. The program also has had unintended effects such as more transactional sex with a casual partner and unwanted pregnancies. One explanation could be that behavior change and social norm interventions may inadvertently encourage those farther from the norm to adjust their behavior to match it (Paluck and Ball, 2010).

In Rwanda, a VSLA program focusing on women's economic empowerment engaged men and contributed to more equitable household decision making, increased couples' communication, and decreased couple conflict, but did not influence IPV rates (Slegh et al., 2013). Studies of other programs including Program H in Brazil and India found some positive impacts, but also no impacts in some cases (Pulerwitz et al., 2010; Barker et al., 2007; Verma et al., 2008). In Cote d'Ivoire, South Africa and Burundi, discussion group-based IPV prevention programs delivered alongside microfinance had mixed results, with few or no gains in Burundi and Cote d'Ivoire (Ferrari and Iyengar, 2010; Hossain et al. 2014) and large gains in South Africa (Kim et al. 2007, Iyengar and Ferrari 2011). These studies evaluated the impact of single-sex discussion groups, while there is an emerging consensus of the need to involve both men and women together to challenge prevailing gender norms. Social norm theory suggests that community and society-wide factors and expectations about others' beliefs and behaviors may be a binding constraint to reducing IPV, yet few discussion group interventions included such elements.

Another example of community-wide interventions is SASA! in Uganda. SASA! means "Now!" in Kiswahili. The program employs multiple strategies to build a critical mass of engaged community members, leaders, and institutions, including local activism, media and advocacy, communication materials, and training. The program's community engagement and mobilization involves four phases: Start, Awareness, Support, and Action. The content evolves with each phase, with power as a central theme. Results from a randomized controlled trial suggest positive effects after three years, with (i) a reduction in levels of IPV against women of 52 percent; (ii) an increase of 28 percent in the share of women and men finding it is acceptable for women to refuse sex; and (iii) an increase of 50 percent in the share of men and women believing that physical violence against a partner is unacceptable.

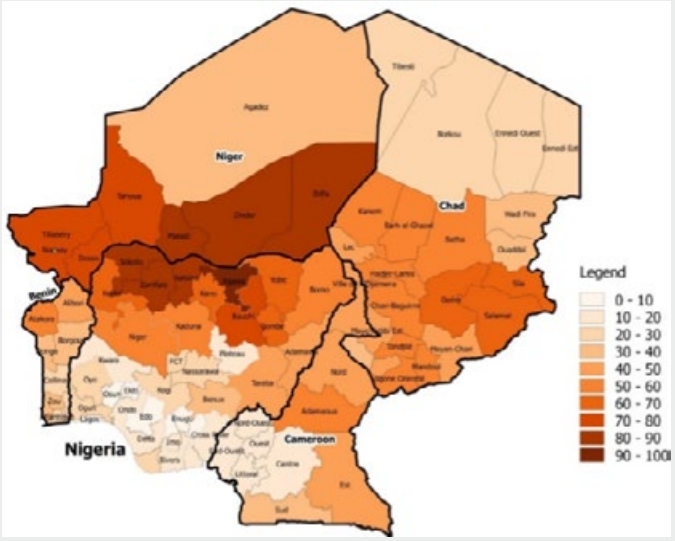
Finally, beyond programs targeting social norms, it should be noted that conditional and unconditional cash transfers may also have an impact on IPV. Evaluations suggest reductions in reported IPV (Bobonis et al., 2013; Hidrobo and Fernald, 2013; Green et al., 2015; Haushofer and Shapiro, 2016), but in Ecuador a cash transfer programs appears to have led to an increase in IPV (Buller et al., 2016).

TARGETING

Ideally, all girls and women should benefit from interventions aimed at achieving gender equality. At the same time, in practice governments face difficult budget constraints. Given such constraints, it is often better to concentrate available resources in high prevalence areas for gender inequality or a particular manifestation of it such as child marriage (such areas are sometimes called "hotspots") than to spread resources too widely. The rationale for concentrating resources in a limited number of geographic areas is that this may have a better effect to reach tipping points that can lead to changes in social norms at the community level. To consider an extreme example, consider a government that may have a budget to provide scholarships to 100,000 girls to keep them in schools, which would also help in reducing the prevalence child marriage and early childbearing. One approach would be to sprinkle the resources to a large number of geographic areas, but in that case, while the girls receiving the scholarships would benefit, other girls would probably not benefit. The alternative approach would be to target resources to specific areas with low rates of secondary school enrollment and concurrently a high prevalence of child marriage or early childbearing. The girls who would receive the benefits would be better off, but it could be that by having many girls in the targeted communities going to school longer, the dynamics in the communities would also change. For example, if many girls remain in school, the pressure to marry girls early would be reduced for parents as the local "marriage market" would have been altered. In other words, concentrating resources in targeted areas of needs can lead to tipping points at the level of communities that may then generate benefits for all girls in those communities.

Exploiting the potential benefits of tipping points requires careful planning and attention to local realities. But a first basic step is to identify where high prevalence areas are. This step, which would be part of a basic diagnostic of gender inequality in a country as discussed in Box 22, can often be undertaken using existing data. As an illustration, Figure 14 visualizes the prevalence of child marriage in Nigeria and neighboring countries. Some areas of the country clearly suffer from higher prevalence rates and lower completion rates than others. In Figure 14, the analysis for Nigeria is conducted at the level of states, but this type of analysis can be replicated at a lower level of disaggregation with census data. On purpose, the same statistics are provided for

Figure 14: Hight Prevalence Areas for Child Marriage among Girls Aged 18-22 in Nigeria



Source: Authors' estimation using DHS data.

adjacent countries, showing that high prevalence areas often are cross-border. For example, Hausa communities in the North East of Nigeria have high rates of child marriage, but so do Hausa communities in Niger. In such cases, there may be benefits from regional projects, as illustrated at the World Bank by the Sahel Women Empowerment and Demographic Dividend project.

Even though common sense suggests that targeting high prevalence areas may have benefits to reach tipping points, changing social norms is not easy, and our understanding of which approaches may work best is still limited (Marcus, 2018.). It should also be clear that whether strategies targeting social norms are likely to work may depend on local conditions since the role of social norms, for example in leading to child marriage, is not the same in all communities. For example, research suggests that in Brazil, social norms play an important role in leading to child marriages (Taylor et al., 2019), but this is not always the case in Malawi (Steinhaus et al., 2019).

BOX 22: DIAGNOSTICS AND STRATEGIES FOR GENDER EQUALITY

Multiple interventions are required to achieve gender equality. These interventions involve different agencies and Ministries. Effective coordination mechanisms are therefore required. Consider simply the need to ensure that girls remain in school, which can also help in delaying marriage and childbearing. Within the Ministry of Education, several departments are likely to be in charge of different types of programs, so that coordination is required within the Ministry itself. Many countries have several Ministries dealing with education, by level. In addition, other Ministries and agencies have a role to play. Ministries of labor and social protection tend to be in charge of some of the second chance programs for children who dropped out, and they have the main responsibility for the implementation of assistance programs and cash transfers. The provision of basic infrastructure in schools is typically the responsibility of a Ministry of Public Works or its equivalent, but the provision of water, sanitation, and electricity tends to be managed by separate Ministries, one for water and sanitation, and the other for electricity. Health policies, both in early childhood and for adolescent girls in the case of SRH services are managed by Ministries of Health. Apart from these various and possibly other Ministries, such as Ministries of Women's Affairs and agencies for specific vulnerable groups, the private sector is also a key player for gender equality through both faith-inspired and private secular education providers. Overall, the multitude of organizations with a role to play calls for strategic vision and coordination mechanisms.

In practice, the process followed to develop strategies for gender equality is likely to change depending on the country, but core steps can be recommended. Strategies for gender equality could be relatively simple or more sophisticated, depending on country capacity and needs. The strategies could stand by themselves, or they could be embedded in broader development strategies. How the strategies will be prepared and how often they will be updated and revised will also depend on country circumstances. But in general, each strategy should (i) assess major areas where gender inequality is prevalent as well as the main determinants of a lack of gender equality; (ii) set "SMART" targets for gender equality; (iii) prioritize public actions for gender equality; (iv) establish systematic monitoring of trends in gender equality indicators as well as evaluate the impact of government programs and policies for gender equality; and finally (v) ensure that the strategy is developed, implemented, and monitored in a participatory way.

Importantly, the gender equality strategy should be grounded in an understanding of the extent, nature, and various challenges to gender equality. Strategies for gender equality should therefore be based on a diagnostic of gender equality issues. This requires appropriate data as well as analysis, and a process to achieve consensus on the findings from the diagnostics. Once a gender inequality diagnostic is available, the next step consists for Ministries and other stakeholders to set targets for gender equality. As noted by Christiaensen et al. (2002), targets may serve as an incentive mechanism that affects behavior in at least three ways: (1) Resource mobilization (targets help in mobilizing human and financial resources in order to achieve certain goals; (2) Resource allocation and consensus building (the process of setting targets helps in revealing priorities and allocating resources); and (3) Accountability (targets provide benchmarks against which the performance of Ministries and other agencies can be judged).

Finally, target setting is linked to the government's budgetary process and fiscal constraints. Attaining targets must not only be technically feasible, but also fiscally feasible, and thus must take into account the budget, so that cost estimates must be prepared. The fiscal feasibility of gender equality targets depends on the government's capacity for both increasing public spending and enhancing the efficiency of that spending. Again, while this discussion is fairly general and could be applied to many other issues apart from that of gender equality, it is hoped that it provides some pointers on processes to follow to prepare such strategies.

CONCLUSION

Gender inequality remains pervasive. Women are less likely than men to join the labor force and to work for pay. When they do, they are more likely to work part-time, in the informal sector, or in occupations that have lower pay. These disadvantages translate into substantial gender gaps in earnings, which in turn decrease women's bargaining power and voice. Many girls are married or have children before the age of 18, before they may be physically and emotionally ready to become wives and mothers. In part due to child marriage, girls' average educational attainment in low income countries remains lower than boys, and in most developing countries adult women are less literate than men. Women and girls also face risks of gender-based violence in their homes, at work, and in public spaces. Their voice and agency is often lower than that of men, whether this is within the household, at work, or in national institutions. This also affects their children. Children of young and poorly educated mothers often face higher risks of dying by age five, being malnourished, and doing poorly in school. Fundamentally, gender inequality disempowers women and girls in ways that deprive them of their basic human rights.

The primary objective of this study was to estimate selected impacts and costs of gender inequality. Impacts were documented in this study in five main areas: (1) earnings and standards of living; (2) educational attainment, child marriage and early childbearing; (3) fertility and population growth; (4) health, nutrition, well-being, and violence; and (5) agency, decision-making, and social capital. The potential economic costs of gender inequality in terms of lost wealth for countries are very large. Table 23 provides a summary of the estimated potential impacts of gender inequality by domain, together with an indication of country coverage for the estimations. This is done by distinguishing estimates based on global data from those based on a core set of up to two dozen developing countries (DCs). Potential impacts are summarized by showing gains from achieving gender equality in comparison to current conditions. It should be emphasized that what is measured when using regression analysis is associations, not necessarily causal impacts. In addition, for some indicators, the data pertain to reported behaviors and perceptions, thereby making interpretation more tentative. Table 23 also summarizes selected monetary costs from gender inequality. The estimates are only orders of magnitude since they depend on models and assumptions. But they demonstrate that the potential costs of gender inequality are high not only for girls and women, but also for their communities and societies.

The largest cost of gender inequality by far in Table 23 relates to earnings, simply because gaps in earnings are observed in virtually all countries, including upper middle and high income countries that concentrate the bulk of the world's wealth. In comparison to losses from gender inequality in earnings at US$172 trillion globally, losses associated with high population growth (welfare losses and budget costs) and stunting for young children are small, essentially because those issues are salient in low and lower-middle income countries, and these countries have low levels of wealth. But the costs are not small in comparison, for example, to total annual net official development assistance (ODA) provided to developing countries. ODA was estimated at US$148 billion in 2016. The losses from gender inequality through population growth and stunting are therefore far from negligible in comparison to ODA in the developing world, representing a substantial share of the total losses from gender inequality in many of those countries.

Apart from measuring selected impacts and costs of gender inequality, the study provided guidance on the investments that could help reduce the cost of gender inequality. This guidance is not meant to be comprehensive, nor exhaustive. Since gender inequality affects girls and women in virtually all aspects of their life, a wide range of interventions to reduce gender inequality and mitigate its impacts should be implemented. But to keep the analysis manageable, the focus was principally on three types of investments corresponding to the three types of economic costs documented above. Along a simple life cycle model, the study considers: (1) Investments in early childhood development to reduce the impact of gender inequality on young children; (2) Investments in adolescent girls to delay marriage and childbearing while also improving education opportunities, which would help reduce population growth; and (3) Investments in adult women to improve employment and earnings opportunities and increase human capital wealth. Finally, the study suggested to target high prevalence areas for gender inequality or some of its particular manifestations through interventions in order to reach tipping points on social norms in communities, and to prepare diagnostics and strategies to end gender inequality.

Table 23: Selected Potential Impacts and Costs/Benefits from Gender Equality

Domain	Coverage	Potential Impacts
Earnings and standards of living	Global	Increase in women's human capital wealth of more than half
	Global	Gain in women's labor force participation and full-time work of 20 percentage points
	Global	Substantial reduction in poverty from higher earnings and lower fertility
Educational attainment, child marriage and early childbearing	Global	Elimination of child marriage
	DCs	Reduction in early childbearing by at least three fourths
	Global	Gains in educational attainment for girls in low-income countries
Fertility and population growth	DCs	Reduction in total fertility by 13 percent
	DCs	Increase in contraceptive use by 12 percent
	Global	Reduction in population growth rate by 0.26 percentage point in 16 countries
Health, nutrition, well-being, and violence	Global	Improvement in women's health and psychological well-being
	DCs	Reduction in under-five mortality rate by 5 percent
	DCs	Reduction in under-five stunting rate by 7 percent
	DCs	Increase in women's knowledge of HIV/AIDS and reduction in violence
Agency, decision-making, and social capital	DCs	Increase in women's decision-making by 45 percent
	Global	Improvement in women's ability to assess quality of basic services
	DCs	Increase in likelihood of birth registration by 5 percent
	Global	Increase in women' reported ability to engage in altruistic behaviors
	Global	Increase in women's reported ability to rely on friends when in need
Potential economic costs	Global	Loss in HC wealth from earnings inequality of US$172 trillion
	DCs	Loss in HC wealth from stunting of US$71 billion in 17 countries
	DCs	Loss in wealth per capita equivalent to US$80 billion in first year in 16 countries due to high population growth (with cumulative effects over time)
	DCs	Budget costs in education of up to US$27 billion by 2030 in 16 countries

Source: Wodon (2018).
Note: DCs = Developing countries.

Investments to end gender inequality should not be based solely on economic considerations. The primary motivation for ending gender inequality should be to address the substantial risks and suffering affecting girls and women throughout their life. However, demonstrating the magnitude of the impacts and costs of gender equality provides additional justification for investments in girls and women. While further work is needed to identify the best policy options at the country level to improve opportunities for girls and women, lessons can be learned from international experience. Ending gender inequality is not only the right thing to do from a moral and ethical standpoint, it is also a smart investment.

APPENDIX 1: DATA AND METHODOLOGY

DATA SOURCES

Three main types of surveys are used for the quantitative analysis. Estimates of gender inequality in earnings are based on nationally representative household and labor force surveys from the World Bank's Global Labor Database (GLD), previously referred to as the I2D2 database. The analysis builds on previous work at the World Bank to measure human capital wealth for 141 countries as part of an analysis of the changing wealth of nations (Hamilton et al., 2018). Human capital wealth is defined as the present value of the future incomes of the labor force, and it can be compared to other sources of wealth such as natural or produced capital. The estimates of human capital wealth have been disaggregated by gender. When using surveys in the GLD database and estimating human capital wealth, analysis is conducted for each country separately.

The second main source of data for the estimations is the Demographic and Health Surveys (DHS). Building on previous work on the economic impacts of child marriage and the cost of not educating girls, detailed analysis of the correlates of selected development outcomes was implemented with the most recent DHS for 19 developing countries: Bangladesh, Burkina Faso, Democratic Republic of Congo, Dominican Republic, Egypt, Ethiopia, Guinea, India, Malawi, Mali, Mozambique, Nepal, Niger, Nigeria, Pakistan, Republic of Congo, Tanzania, Uganda, and Zambia. The sample is titled towards sub-Saharan Africa and South Asia; Latin America and the Caribbean and the Middle East and North Africa are each represented by one country. As with surveys from the GLD database, regression analysis is conducted for each country separately when using DHS data.

The rationale for the choice of the 19 countries was based on three main considerations. First, many of the countries have low levels of educational attainment for girls, high rates of child marriage and early childbearing, as well as relatively high fertility rates and high rates of under-five mortality and stunting. These were some of the core outcomes for which estimations of the potential impact of gender inequality were carried, and it therefore made sense to select countries for the estimations where achieving gender inequality was likely to make a substantial difference. Second, several of the countries were selected to respond to demand for analytical work on those countries to inform on-going operational work at the World Bank. Third, an effort was made to have representations from several regions, and especially from sub-Saharan Africa and South Asia where gender inequality tends to be more pronounced in specific areas considered for this study.

The third main source of data is the Gallup World Poll which covers more than 150 countries. The Poll typically surveys 1,000 individuals in each country, using a standard set of core questions that has been translated into the major languages of the respective country. Because the samples at the country level are relatively small, the regression analysis for this study is conducted with the pooled dataset. While survey data or specific questions are not available for all years for all countries, the pooled data set used for the analysis is large, with more than 200,000 observations. A total of 114 countries are included in the final sample: 10 from East Asia and the Pacific, 40 from Europe and Central Asia, 21 from Latin America and the Caribbean, four from the Middle East and North Africa, one for North America, seven from South Asia, and 31 from sub-Saharan Africa. While some regions have better representation than others, most of the world's population is included because large counties in terms of population are covered.

In addition to relying on surveys, the team conducted qualitative work on the constraints faced by girls to continue their education, with a focus on sub-Saharan Africa were these constraints are most severe. Qualitative data were obtained for countries in West Africa, Central Africa, and East Africa. While these data are not used systematically for this note, excerpts from respondents in focus groups or in-depth qualitative interviews have been used in background work to illustrate findings that emerge from the quantitative analysis.

METHODOLOGY

The study aims to estimate the potential impacts of gender inequality on development outcomes and the economic costs associated with some of these potential impacts. As defined in World Bank (2012, 2016), gender refers to the social, behavioral, and cultural attributes, expectations, and norms associated with being male or female. Gender equality (or inequality) refers to how these factors determine the way in which women and men relate to each other and to the resulting differences in power between them. This definition

however needs to be operationalized in order to measure the potential impacts of gender inequality on various outcomes.

In this study, for some indicators, simple statistics are used to measure the potential impacts of gender inequality. This is done when gender differences in outcomes are prima facie evidence of gender inequality, as is the case for most indicators related to earnings and labor force participation, as well as educational attainment, child marriage, and early childbearing. For other indicators, regression analysis is used instead. This is done when gender inequality may affect outcomes for both genders even if differences in outcomes by gender are small. For example, gender inequality affects the risk of under-5 stunting or under-5 mortality for boys and girls alike. Regression analysis is also used when data are only available for women on a specific outcome. For example, in most Demographic and Health Surveys, data on the risk of being a victim of intimate partner violence is available for women only. As shown in Table 24, regression analysis is used to assess the potential impacts of gender inequality on most indicators related to (1) fertility and population growth; (2) health, nutrition, well-being, and violence, and (3) agency, decision-making, and social capital. When using regression analysis, simulations rely on proxies for how achieving gender inequality (for example by ending child marriage and early childbearing, or by ensuring that girls have the same educational attainment as boys) would affect the outcomes of interest. Those proxies are of course imperfect and they may not capture the full effect of gender inequality, but the simulation approach helps in suggesting an order of magnitude for the potential impacts.

The term 'potential impact' is used for simplicity and for the study to be readable to non-technical audiences, but one must be careful about not necessarily inferring causality. Estimates of potential impacts are obtained through regression analysis based on the identification of indicators which proxy for gender inequality and controlling for other variables that may affect the outcomes of interest. Different types of regression techniques are used depending on the outcomes of interest. What is measured are thus statistical associations, and not necessarily impacts as could be observed with randomized control trials or quasi-experimental methods. Said differently, the regression analysis provides estimates of potential impacts, but there is always a risk of bias (and in some cases upward bias) in the measures of the potential impacts being reported due, for example, to the risk of omitted variables bias.

Table 24: Methodology for Measuring the Potential Impacts of Gender Equality on Outcomes

Domain	Measurement of the Potential Impacts of Gender Inequality	
	Statistical Differences in Outcomes by Gender	Regression Analysis Using Proxies for Gender Inequality
Earnings and standards of living	✓	
Education, child marriage, and early childbearing	✓	
Fertility and population growth		✓
Health, nutrition, well-being, and violence		✓
Agency, decision-making, and social capital		✓

Source: Authors.

To reduce the risk of bias in coefficient estimates, different specifications for the regressions have been used, and we typically report results obtained with the largest number of controls. Based on measures of potential impacts, potential costs associated with selected potential impacts are then computed. Note that we provide potential cost estimates only for a subset of potential impacts. These potential costs rely on additional assumptions and are thus also tentative. The estimated costs presented therefore capture only part of the total costs. More details on the data sources and methodologies used for estimations and how they relate to key findings are available from the authors.

When considering economic costs, the analysis focuses on (i) earnings; (ii) "welfare" or standards of living as they relate to

population growth; (iii) budget savings from lower population growth; and (iv) other benefits such as those related to individual feelings and perceptions for which no economic costs are computed. The focus on these four types of costs is driven in part by data availability and the ability to estimate approximate costs with a reasonable degree of confidence. The basic idea is to consider human capital wealth per capita as the main indicator of interest. Since human capital wealth is based on the earnings of the labor force, gains in human capital wealth per capita arise when earnings for the labor force increase (larger nominator), or when the size of the population among which human capital wealth is shared decreases (smaller denominator). For earnings, the focus is on (1) potential gains from ending gender gaps in current earnings between adult men and women, and (2) potential gains from lower under-5 stunting rates that lead to higher productivity in adulthood. When considering population growth, the focus is on the reduction in the size of the population in the future that could result from achieving gender inequality today. Finally, as an illustration of other potential effects, the impact of gender inequality on budget spending for education is also considered to show that lower population growth could help in achieving savings in the cost of basic service delivery, so that those savings could be reinvested in higher quality services or an expansion in services to populations currently not served. While other types of costs could be considered, these are some of the largest economic costs of gender inequality, and the framework allows for avoiding double counting costs (there is no overlap between cost categories).

Note that considering separately impacts on the nominator and denominator of human capital wealth as described in Table 25 does not imply that interaction effects between impacts on various outcomes are not considered. For example, ending child marriage as one of the benefits of achieving gender inequality has impacts on both earnings and population growth. The pathways through which these impacts may be observed are complex, but both impacts are captured when simulating gender inequality in earnings and measuring the potential reduction in population growth. Said differently, while the study does not consider separately all pathways through which gender inequality affects outcomes and all the interactions between outcomes, it does capture overall effects in reduced form, either through simple statistical comparisons of outcomes by gender or through regression analysis when simple comparisons of outcomes by gender do not adequately capture effects.

Table 25: Methodology for Estimating Economic Costs Associated with Potential Impacts

Domain	Measurement of Economic Costs Associated with Impacts	
	Nominator (Incomes or Expenditure)	Denominator (Population Size)
Higher earnings via gender equality in earnings	✓	
Higher earnings via reduced under-5 stunting rates	✓	
Higher welfare via reduced population growth		✓
Budget savings via reduced population growth	✓	
Other benefits without estimates in monetary terms	N/A	N/A

Source: Authors.

APPENDIX 2: HUMAN CAPITAL WEALTH ESTIMATES

Human capital wealth is defined as the discounted (present) value of future earnings for a country's labor force. In practice, we estimate how likely it is that various types of individuals will be working, and how much they will earn when working. By "various types" of individuals, we mean individuals categorized by age, sex, and level of education. Essentially, we use household surveys to construct a dataset that captures (1) the probability that individuals are working depending on their age, sex, and years of education; and (2) their likely earnings when working, again, by age, sex and years of schooling. This is done separately for men and women so as to produce estimates of human capital wealth by gender. Typically, women's estimated lifetime earnings are significantly lower than for men.

Estimates of the likelihood of working for individuals are based on observed values in household and labor force surveys. Estimates of expected earnings are based on Mincerian wage regressions. The regressions are used to compute expected earnings throughout individuals' working life, considering their sex, education level, and assumed experience (computed based on age and the number of years of education completed). Expected earnings are computed for all individuals in the surveys from age 15 to age 65, noting that some individuals may go to school beyond age 15. The analysis also considers the life expectancy of the labor force. In countries with high life expectancy, workers are expected to work until age 65, but in other countries they may not be able to. For simplicity, when estimating the discounted value of future earnings, the same discount factor for future earnings is applied to all countries.

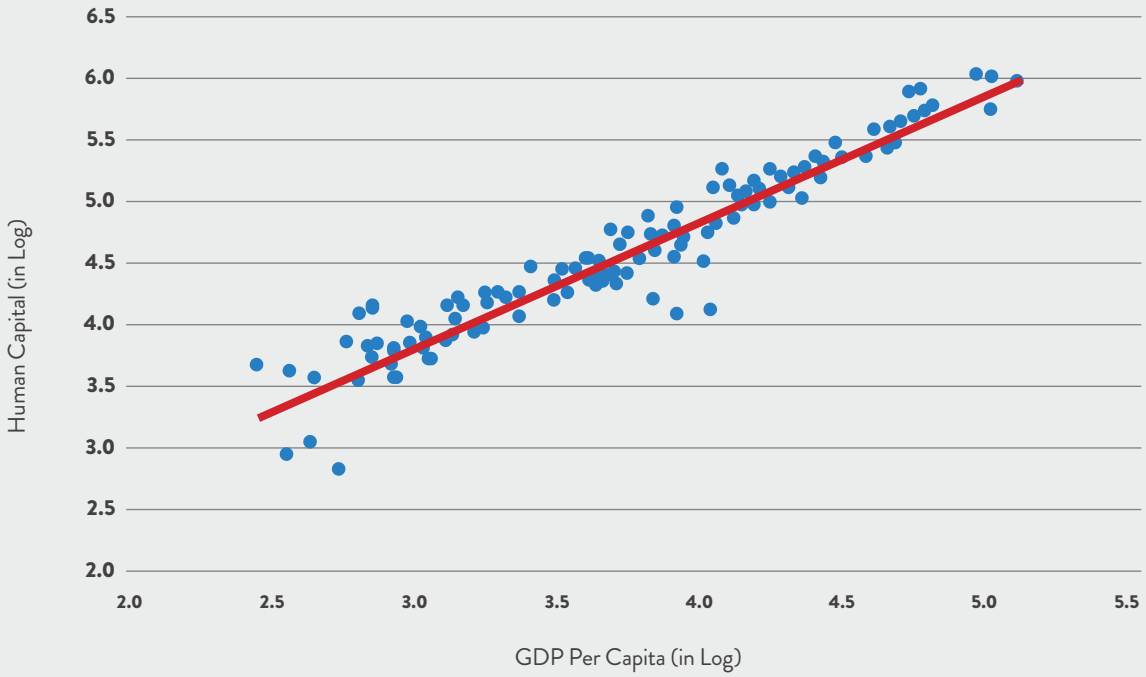
The household surveys used for the computation of the earnings profiles—as well as the probability of working—are nationally representative. The surveys are in most cases of good quality, but they may still generate estimates that are not consistent with either the system of national accounts or population data for the countries. Therefore, two adjustments are made. First, to ensure consistency of the earnings profiles from the surveys with published data from national accounts, earnings estimates from the surveys are adjusted to reflect the share of labor earnings (including both the employed and the self-employed) in GDP as available in the Penn World Tables. Second and separately, the estimations also rely on two variables obtained from data compiled by the United Nations Population Division: (1) population data by age and sex (so that the data in the household surveys can be better calibrated); and (2) mortality rates by age and gender (so that the expected years of work can be adjusted, accounting for the fact that some workers will die before age 65). Again, we adjust data from the surveys to population estimates from the United Nations to ensure that estimates are adequate. For individuals in the 15-to-24 age group, the probability of remaining in school is also considered.

Given that the estimation of human capital wealth is based on Mincerian wage regressions, the measure accounts not only for the number of years of schooling completed by workers, but also for the earning gains associated with schooling (which implicitly factors in the quality of learning in school), whether individuals work (labor force participation), and for how many years they work (accounting for health conditions through life expectancy). Estimations of human capital wealth are done separately for men and women. This means that once we have estimates of human capital wealth by gender, we can estimate losses in human capital wealth due to gender inequality in earnings in a very simple way. If we denote a country's human capital wealth as measured

from the expected future earnings of men and women as HCM and HCW, respectively, and the adult population of men and women by POPM and POPW, the earnings per adult men and women can be defined as hcM=HCM/POPM and hcW=HCW/POPW. Under gender equality, interpreted as ensuring that adult men and women have the same future expected earnings, human capital for women would increase from hcW to hcM. Therefore, the loss in human capital wealth from gender inequality is measured as (hcM-hcW)×POPW. Details are provided in Wodon (2018).

Estimates of human capital wealth by gender up to 2014 are based on Wodon and de la Brière (2018), following Hamilton et al. (2018) for estimates of total human capital wealth (both sexes included). The World Bank is in the process of updating its estimates of the changing wealth of nations, including human capital wealth, but these estimates are not yet available. For this study, estimates of human capital wealth by gender for 2017 are therefore based on projections. The estimates are based on a projection that takes into account the gender gaps observed in 2014 (these gaps do not change very much from one year to the next), and growth in real GDP per capita and population between 2014 and 2017. These projections are tentative, but they are likely to be reasonably accurate given that levels of GDP per capita across countries explain close to 95 percent of the variation in the estimates of human capital wealth per capita across countries, as shown in Figure 16.

Figure 16: Human Capital Wealth Per Capita and GDP Per Capita



Source: Hamilton et al. (2018).

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