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THE COST OF GENDER INEQUALITY

GENDER INEQUALITY, HUMAN CAPITAL WEALTH, AND DEVELOPMENT OUTCOMES IN UGANDA

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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 income or economic 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).

In many countries, girls' average educational attainment remains lower than boys 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 males, 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.

KEY RESULTS

This note has two objectives. The first is to estimate potential losses in national wealth due to inequality in earnings between men and women in Uganda. The second is to document the impact of gender inequality in other areas such as fertility and population growth, indicators of child health, and measures of women's agency. Overall, the analysis suggests that the development impact of gender inequality is large. Key findings from the note are as follows:

- A country's wealth is the basis for its long-term development and the creation of income (Gross Domestic Product). The three main components of wealth are produced capital, natural capital, and human capital. In Uganda, human capital – the value of the future earnings of the labor force, accounts for 50 percent of the country's wealth.
- Inequality in human capital wealth between men and women remains substantial. In Uganda women account for 39 percent of human capital wealth versus 61 percent for men. These estimates are similar to those observed for the sub-Saharan African region.
- Women's human capital could increase from US\$102 billion to US\$163 billion if women were earning as much as men, yielding a gain in wealth of up to US\$61 billion.
- Per capita, gender equality could increase wealth by up to US\$1,619, an increase of 11.8 percent versus the base value of total wealth per capita in the country. These estimates are not meant to be precise, but they give an order of magnitude of potential benefits.
- Gender inequality also has large impacts in other areas. Achieving gender equality could reduce the fertility rate by 11 percent from its base value. This could lead to a substantial reduction in population growth and thereby an increase in human capital wealth per capita and well-being.
- Gender equality could also lead to a reduction of under-five mortality and stunting by respectively 13 percent and five percent. It could increase women's decision-making ability within the household by more than a fourth. There could also be benefits towards reducing intimate partner violence or improving indicators such

as knowledge of HIV-AIDS and birth registrations.

- In many of those areas, associated costs are high. This is for example the case for impacts on fertility and population growth which affect standards of living.
- Two main factors lead women to have less earnings and thereby lower human capital wealth than men: lower labor force participation rates and fewer hours worked in the labor market, and lower pay. These factors keep many women in a productivity trap due in part to social norms relegating them to unpaid care and informal work.
- To increase human capital wealth, investments throughout the life cycle are needed, from early childhood development and learning in schools to building job-relevant skills that employers demand, encouraging entrepreneurship and innovation, and ensuring that women have the same access to opportunities and resources as men. Policies are also needed to tackle other aspects of gender inequality, such as child marriage.

INTRODUCTION

This note has two main objectives. The first is to estimate potential losses in national wealth due to inequality in earnings between men and women in Uganda. The second is to document the impact of gender inequality in selected other domains, including fertility and population growth, health outcomes for young children, and measures of women's agency.

Consider first potential losses in national wealth due to gender inequality. There is a substantial literature on the impact of gender inequality on economic growth and performance. By focusing on wealth, the approach used for measurement in this note is different. Wealth is the assets base that enables countries to produce income (Gross Domestic Product or GDP). A country's wealth includes various types of capital. Produced capital comes from investments in assets such as factories, equipment, or infrastructure. Natural capital includes assets such as agricultural land and other renewable and non-renewable natural resources. However, the largest component of countries' wealth often resides in their people. If gender equality in earnings were achieved, countries could increase

their human capital wealth, and thereby their total wealth substantially. This could enable them to strengthen the sustainability of their development path, and thereby future growth in GDP per capita. The note provides estimates of potential losses in national wealth in Uganda due to gender inequality in earnings.

Consider next the impact of gender inequality in other areas. Gender inequality has implications not only for women's earnings, but also for a wide range of other areas which for simplicity can be considered as pertaining to women's roles as wives and mothers "at home", as opposed to their role "at work". In practice, the spheres of home and work are not always easy to delineate, and they are not independent of each other. But for expository purpose, these impacts "at home" are considered separately. Specifically, three main types of impacts are considered: impacts on (i) women's total fertility towards the end of their reproductive age and thereby population growth, (ii) under-five mortality and stunting, and (iii) women's agency. The note is structured as follows. The first two sections provide estimates of national wealth for Uganda and losses from gender inequality in earnings. The next section documents the impact of gender inequality in other areas. The last section provides a few general guidelines on policy options to achieve gender equality. A brief conclusion follows.

BASELINE ESTIMATES OF UGANDA'S NATIONAL WEALTH

This section presents baseline estimates of human capital and total wealth from Lange et al. (2018) for Uganda. Tables 1 and 2 provide estimates in absolute value and per capita terms. All estimates are in constant US dollars of 2014. As mentioned earlier, total wealth includes natural capital, produced capital, human capital, and net foreign assets. Uganda's wealth stood at US\$519 billion in 2014. This represented a large increase in real terms of 182 percent over 20 years (annual growth rate of 5.3 percent per year). Human capital wealth reached US\$260 billion in 2014, an even larger increase of 321 percent since 1995 (average annual growth rate of 7.5 percent). Human capital accounted in 2014 for half of total wealth, versus 38 percent for natural capital and 14 percent for produced

capital (this sums up to more than 100 percent due to negative net foreign assets). The share of human capital in total wealth increased over time, while the share of natural capital decreased. In per capita terms, total wealth stood at US\$13,731 in 2014 versus US\$9,010 in 1995. This represents an annual growth rate of two percent, with the difference versus the growth in total wealth due to population growth. Human capital wealth stood at US\$6,889 per person in 2014 versus US\$3,026 in 1995.

Most of the country's natural capital consists of crop land. There was a decrease in recent years in the value of crop land per capita that led to an overall decrease in total wealth per capita between 2010 and 2014. This decrease due essentially to a drop in the production of plantains according to data from the Food and Agricultural Organization. As production of plantains fell, this led to a drop in the valuation of cropland since that valuation is based on the discounted value of the sale of agricultural production in the future, with future expected production based on existing patterns production and expected gains in productivity. With the exception of the recent decrease in the value of agricultural land, which could be reversed in the future, virtually all categories of assets saw an increase in value per capita over time.



Table 1: Baseline Estimates of Uganda's Total Wealth (US\$, millions)

Millions, constant 2014 USD	1995	2000	2005	2010	2014
Total wealth	183,930	211,616	349,216	463,389	518,839
Produced capital (including urban land)	20,492	33,362	49,839	46,543	70,722
Natural capital	105,668	99,343	166,346	212,559	199,092
Forests, timber resources	649	622	815	975	1,027
Forests, non-timber resources	795	714	633	508	408
Protected areas	9,576	9,012	15,837	23,048	25,343
Land	94,648	88,995	148,913	187,729	172,284
Cropland	75,220	71,190	120,094	147,312	130,299
Pastureland	19,428	17,805	28,819	40,417	41,985
Sub-soil assets	-	-	148	299	30
Human capital	61,777	83,670	141,016	210,382	260,304
Net foreign assets	-4,007	-4,758	-7,985	-6,096	-11,279
Population (millions)	20.4	23.8	28.0	33.1	37.8
Share of total wealth					
Produced capital (including urban land)	11%	16%	14%	10%	14%
Natural capital	57%	47%	48%	46%	38%
Human capital	34%	40%	40%	45%	50%
Net foreign assets	-2%	-2%	-2%	-1%	-2%

Source: Lange et al. (2018).

The profile of wealth of Uganda by broad asset categories is not unlike that of a typical sub-Saharan African country. While on average wealth per capita in sub-Saharan Africa is at twice the level observed in Uganda, the shares of wealth by broad type of asset are similar, with 16 percent for produced capital, 36 percent for natural capital, and 50 percent for human capital in the region. Uganda however has seen its wealth increase substantially over time, while this has not been the case in per capita terms for the region

as a whole due to drops in wealth in a few large countries such as the Dominican Republic of Congo and Nigeria. Still, there is scope for improving Uganda's performance in building its wealth. At some point in the future, once exploitation starts, Uganda will benefit from wealth related to oil production. But more fundamentally, as is the case for other countries transitioning from low to middle income countries, human capital should increase further and gender equality has a role to play.

Table 2: Baseline Estimates of Uganda's Per Capita Wealth (US\$)

Per Capita, constant 2014 USD	1995	2000	2005	2010	2014
Total wealth	9,010	8,907	12,453	13,979	13,732
Produced capital (including urban land)	1,004	1,404	1,777	1,404	1,872
Natural capital	5,177	4,182	5,932	6,412	5,269
Forests, timber resources	32	26	29	29	27
Forests, non-timber resources	39	30	23	15	11
Protected areas	469	379	565	695	671
Land	4,637	3,746	5,310	5,663	4,560
Cropland	3,685	2,997	4,283	4,444	3,449
Pastureland	952	749	1,028	1,219	1,111
Sub-soil assets	-	-	5	9	1
Human capital	3,026	3,522	5,029	6,346	6,889
Net foreign assets	-196	-200	-285	-184	-299

Source: Lange et al. (2018).

LOSSES IN HUMAN CAPITAL WEALTH DUE TO GENDER INEQUALITY

Gender inequality is meant to represent differences in a wide range of development outcomes between men and women, as explained in Box 1. Many of these differences result from social norms and opportunity gaps between men and women. Closing these gaps would help improve development outcomes for women (and in some cases men depending on the country). When gaps are closed between men and women, we consider that gender equality is achieved. While other approaches could be used to analyze gender inequality and define what gender equality means or implies, this approach has the merit of being simple.

Researchers looking at the impact of gender inequality on development have typically focused on annual measures of income or growth in income (e.g. Elborgh-Woytek et al., 2013; Cuberes and Teigner, 2015; McKinsey Global Institute, 2015). 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 today. 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 long-term growth. For example, 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.

BOX 1: WHAT IS MEANT BY GENDER INEQUALITY AND ACHIEVING GENDER INEQUALITY

Gender inequality takes many forms. In this section, the focus is on differences in labor market outcomes for men and women due to differences in labor force participation as well as earnings when working. Some of the differences in earnings may themselves be related to other differences including in educational attainment between men and women. But as noted in subsequent sections, gender inequality also takes many other forms. Child marriage affects mostly girls and is therefore a form of gender inequality. Women also tend to have less decision-making ability in their household than men. The impact of these and other forms of gender inequality are considered in this note, and some costs associated with impacts are measure.

We consider that gender equality is achieved in this note when gap between men and women are closed. In the case of earnings, this means that women earn as much as men. In the case of early childbearing or child marriage, we consider that gender equality is achieved when both are eliminated. More details on what is meant by gender equality are provided when discussing specific indicators and the simulations that are undertaken to model gender equality.

In this note, following Wodon (2018, see also Wodon and de la Brière, 2018), we rely on a different approach to measure the losses in earnings that result from gender inequality or, equivalently, the gains associated with gender equality in labor markets. Instead of measuring losses from inequality as annual flows (the GDP approach), we focus on losses in human capital (the wealth approach). The rationale for this focus on wealth is discussed in Box 2. In practice, this is done by measuring lifetime losses in earnings. 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.

Estimations of human capital wealth based on the future earnings of the labor force are done separately for men and women. Hence, we can estimate losses in human capital wealth due to gender inequality in a simple way (see appendix 1 on the methodology). In 2014, women accounted for 39 percent of human capital wealth in Uganda versus 61 percent for men. These are also essentially the proportions observed for sub-Saharan Africa on average, and the values are similar to existing estimates of gender shares in GDP for the region in other studies. How large are the losses in wealth resulting from gender inequality in Uganda? As shown in Table 3, women's human

BOX 2: USING HUMAN CAPITAL WEALTH DATA TO MEASURE THE IMPACT OF GENDER INEQUALITY

When considering the impact of gender inequality on earnings, 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 with the flow approach.

Third, a wealth approach is forward-looking as it emphasizes sustainability. GDP, or more precisely the consumption component of GDP, is essentially the annual return or income that a country reaps from its wealth, the assets base that it uses for production. By focusing on wealth, countries can complement GDP measures and focus on long-term sustainable investments.

We rely in this note on measures of wealth developed by the World Bank in the *Changing Wealth of Nations* study (Lange et al., 2018). Building on previous reports (World Bank, 2006 and 2011), the new wealth estimates cover the period 1995 to 2014. They include 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 estimations of human capital are based on household survey data. They represent a significant improvement over past estimates where total wealth included a large unexplained residual called intangible capital. This residual, it turns out, consists for the most part of human capital. By measuring the shares of human capital wealth associated to men and women at the country level, the methodology enables us to estimate lifetime earnings losses due to gender inequality.

Source: Wodon (2018); Wodon and de la Brière (2018).

capital could increase from US\$102 billion to US\$163 billion under gender equality (see Box 3 on the limitations of these measures). This represents a loss in wealth of up to US\$61 billion due to gender inequality. The estimated increase in human capital wealth from the base is 23.5 percent in 2014, and for total wealth (including natural and produced capital as well as net foreign assets), the increase in wealth is at 11.8 percent. Global estimates as well as estimates for the sub-Saharan Africa region are of a similar order of magnitude in percentage terms from the base. On a per capita basis (including not only the adult population

but also children), gender inequality is leading to a loss in wealth of US\$1,619 per person. These losses are large for a low-income country such as Uganda. They underscore the benefits that could be reaped from achieving gender equality. Over time, the total wealth lost due to gender inequality increases from US\$8 billion in 1995 to US\$61 billion in 2014. This increase comes from population growth, as well as higher standards of living. But other factors that affect human capital wealth also play a role, including factors that affect the share of labor earnings in GDP over time.

Table 3: Loss in Wealth from Gender Inequality in Uganda (US\$, total and per capita)

	1995	2000	2005	2010	2014
Wealth, millions, constant 2014 USD					
Baseline gender shares of human capital					
Men's share of human capital	55.5%	55.9%	56.5%	60.9%	60.9%
Women's share of human capital	44.5%	44.1%	43.5%	39.1%	39.1%
Human capital wealth by gender					
Human capital, men	34,267	46,803	79,613	128,215	158,640
Human capital, women	27,510	36,867	61,403	82,167	101,664
Loss from gender inequality					
Counterfactual human capital, women	35,705	48,992	82,929	132,218	162,850
Increase in human capital	8,195	12,125	21,526	50,051	61,186
Loss as share of baseline human capital	13.27%	14.49%	15.26%	23.79%	23.51%
Loss as share of baseline total wealth	4.46%	5.73%	6.16%	10.80%	11.79%
Per capita wealth, constant 2014 USD					
Baseline wealth					
Human capital per capita, men	1,679	1,970	2,839	3,868	4,199
Human capital per capita, women	1,348	1,552	2,190	2,479	2,691
Loss from gender inequality					
Loss in human capital per capita	401	510	768	1,510	1,619

Source: Based on Wodon (2018); see also Wodon and de la Brière (2018).

BOX 3 LIMITATIONS OF THE METHOD USED TO COMPUTE LOSSES IN HUMAN CAPITAL WEALTH

The estimation of the losses in human capital wealth provided in this note simply assumes that women could work and earn as much as men. The estimation 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 jobs as men (in part thanks to 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, thus not considering the possibility of men having to allocate more time to household chores or unpaid 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 Uganda could gain if women had the same lifetime earnings profile as men without any decrease in men's earnings. In that sense, the estimate could be an upper bound of losses from gender inequality since we do not factor in potential general equilibrium effects. However, higher earnings for women could also lead to more economic activity with positive multiplier effects on the economy and 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 free time and time spent on domestic chores. Overall, especially through multiplier effects, unleashing women's earnings potential could generate larger earnings and human capital gains for both men and women. We also do not account for intergenerational benefits through better education, health, and employment opportunities for their children.

Source: Wodon (2018); Wodon and de la Brière (2018).



SELECTED OTHER IMPACTS OF GENDER INEQUALITY

Gender inequality has implications not only for women's earnings, but also for a wide range of other areas pertaining to women's roles as wives and mothers "at home", as opposed to their role "at work"¹. "At home", gender inequality leads among others to child marriage, early childbearing, and low educational attainment for girls. This, in turn, leads to higher fertility, and thereby higher population growth. Furthermore, when girls are married or have children before the age of 18, they may not be physically and emotionally ready to become wives and mothers. As a result, children of young and poorly educated mothers often face higher risks of dying by age five, being malnourished, and doing poorly in school. Gender equality at home also contributes to women facing higher risks of intimate partner violence. Their voice and agency are limited within the household, as well as at work or in national institutions. Fundamentally, gender inequality disempowers women in ways that deprive them of their basic human rights. A number of these impacts are considered in this section following the framework outlined in Appendix 2.⁷

IMPACT ON TOTAL FERTILITY

The factors leading to fertility are complex. 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 lifetime². This focus stems from our interest in looking at the impact of gender inequality on population growth, which has implications for the ability of Uganda to reap the benefits from the demographic dividend (Box 4). Since we consider the number of children that women have towards the end of their reproductive life, we account for desired fertility and substitution effects in the timing of birth when simulating the effect of gender equality on fertility.

The impact of gender inequality on total fertility is estimated using regression analysis by simulating changes in the characteristics of women that are related to gender inequality and affect total fertility³. Results are provided in Table 4 using data from both the 2011 and 2016 Demographic and Health Surveys (DHS) to test for robustness of the findings. Under gender equality, total fertility could be reduced with the 2016 DHS from 6.73 children per women towards the end of their reproductive life to 5.94 children per women. This is a reduction on average of 0.79 child per women or 11.7 percent. The effects are of the same order of magnitude with the 2011 DHS. The largest share (more than three fourths) of the reduction comes from the impact of child marriage on total fertility. When women marry early, given low access to modern contraception method in Uganda, this leads them to have children earlier and more children over their lifetime. Ending child marriage by itself could reduce total fertility by about nine percent. Clearly, gender equality could help speed up Uganda's demographic transition.

¹In practice, the spheres of home and work are not always easy to delineate, and they are not independent of each other. For example, the burden of domestic work has implications for the ability to engage in so-called "productive" work. Still, it is useful for exposition to consider both spheres sequentially.

²Total fertility is defined here as the number of live births that a woman has over her lifetime. This definition is used for econometric work aiming to measure the marginal impact of child marriage on fertility. By contrast traditional "total fertility rates" are population-level statistics. Our definition of "total fertility" is thus similar, but not exactly the same as "total fertility rates" traditionally measured. The econometric analysis is conducted for women ages 35-49 for sample size considerations. More details on the methodology are available in Onagoruwa and Wodon (2018a).

³Six assumptions are used for simulating gender equality based on the variables included 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 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; (4) the spousal age gap (the difference in age between the wife and her husband/partner) is reduced to five to nine years for women that have a spousal age gap of more than 10 years; (5) women are assumed to be involved in most decisions made in the household; and (6) women do not accept wife beating. The impact of gender inequality on total fertility is obtained by comparing predicted fertility under current conditions with predicted fertility under gender equality.

Table 4: Impact of Ending Gender Inequality on Total Fertility (Number of Live Births)

	Expected value under gender inequality	Expected value under gender equality	Absolute Difference	Percentage change (%)
Total fertility				
2011	7.12	6.42	0.70	9.83
2016	6.73	5.94	0.79	11.74
Average effect	6.93	6.18	0.75	10.79

Source: Authors. Estimates conducted with the 2011 and 2016 DHS surveys.

BOX 4: THE DEMOGRAPHIC DIVIDEND

While different definitions of the demographic dividend have been proposed in the literature, the term is commonly associated with the improvements in standards of living and accelerated economic growth that can result when a developing country achieves a population structure that is favorable in terms of economic growth thanks to a reduction in birth (and death) rates that is followed after a short period by rapid fertility decline. As a result, the share of the population of working age individuals increases sharply for a period of time, which tends to generate faster economic growth. In addition, with lower dependency ratios, households are better able to support themselves and invest among others in education, nutrition, and health (or human capital broadly conceived). These investments in turn may lead younger generations to be better educated and more productive in adulthood. This demographic and human capital transition may help reduce poverty rates dramatically. Achieving gender equality should help reduce population growth and improve education in countries where fertility rates remain high, thereby helping to usher in the demographic dividend.

IMPACT ON UNDER-FIVE MORTALITY AND STUNTING

By weakening conditions for early childhood development, gender inequality may have negative impacts on young children. Early childhood is critical for a child's development. Poor conditions early in life affect brain development and capabilities, with lasting consequences in adulthood. Children born of very young mothers tend to have higher risks of under-five malnutrition and mortality than children born of older mothers. Part of the reason is that some young mothers may simply not yet be ready to give birth. When mothers are poorly nourished, this may put their children at higher risk of intrauterine growth restriction. These and other effects have implications for children as they grow up and in adulthood. For example, research suggests a loss in productivity in adulthood for stunted children.

As for fertility, the analysis of the impact of gender inequality on under-five mortality and stunting is conducted using regression analysis and simulation techniques⁴.

The results are in Table 5. The estimated effects are larger with the 2011 DHS than with the 2016 DHS. It makes sense to consider the average effect for both years as representing the more reliable estimates. Under gender equality, the predicted rate of under-five mortality could be reduced by an average of 0.77 percentage point or 13 percent of the baseline value when considering estimates from both surveys. The predicted under-five stunting rate could be reduced by 1.7 percentage point or seven percent of the average baseline values in the two surveys. These reductions are far from negligible, but they are not as large as some may have thought. This is in large part because while the marginal impact of an early childbirth (being born of a mother younger than 18, considered as one dimension of gender inequality) on the risk 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 could make a difference, it could not end under-five mortality and stunting.

⁴In a similar way to the analysis for fertility, assumptions are used for simulating gender equality: (1) early childbearing 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; (4) the spousal age gap (the difference in age between the wife and her husband/partner) is reduced to five to nine years for women that have a spousal age gap of more than 10 years; (5) women are assumed to be involved in most decisions made in the household; (6) women do not accept wife beating; and (7) women do not have problems getting permission to access medical help for themselves. The impact of gender inequality on the rates of under-five malnutrition and stunting is obtained by comparing predicted rates under current conditions with the rates predicted under gender equality.

Table 5: Impact of Ending Gender Inequality on Under-five Mortality and Stunting (%)

	Expected value under gender inequality	Expected value under gender equality	Absolute Difference	Percentage change (%)
Under-five mortality				
2011	6.49	5.31	1.18	18.18
2016	4.76	4.41	0.35	7.35
Average effect	5.63	4.86	0.77	12.77
Under-five stunting				
2011	33.81	31.03	2.78	8.22
2016	28.05	27.47	0.58	2.07
Average effect	30.93	29.25	1.68	5.15

Source: Authors. Estimates conducted with the 2011 and 2016 DHS surveys.



IMPACT ON AGENCY AND DECISION-MAKING ABILITY

Gender inequality is associated with losses in decision-making, thereby limiting women's aspirations, as well as their voice and agency (Klugman et al., 2014). To assess the impact of gender inequality on decision-making ability, an index is constructed to take a value between zero and 100⁵. The impact of gender inequality on the index is obtained by comparing predicted values under current conditions with values predicted under gender equality⁶. The impact of gender inequality is again substantial, as shown on Table 6. Under gender equality, on average for the two DHS surveys the index of decision-making ability for women could increase from 70.7 (out of a maximum value of 100) to 89.4. This represents a gain on average of 18.7 percentage points or 26.8 percent of the base value of the index, which is rather large.

Table 6: Impact of Gender Inequality on Women's Decision-making Ability (Index)

	Expected value under gender inequality	Expected value under gender equality	Absolute Difference	Percentage change (%)
Decision-making				
2011	66.37	87.94	21.57	32.50
2016	75.01	90.85	15.84	21.12
Average effect	70.69	89.40	18.71	26.81

Source: Authors. Estimates conducted with the 2011 and 2016 DHS surveys.

⁵The variables included in the index are of four types. First, women currently married 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. For each question, women may typically respond according to four modalities: they alone make decisions, they make decisions with the husband/partner, the husband makes decisions alone, or another person makes the decisions (or the husband has no earnings for the question pertaining to use of earnings). Second, women are also 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. In addition, women respond to four different circumstances assessing if a husband is justified in beating their wife in those instances: if the wife goes out without telling her husband, if she neglects her children, if she argues with her husband, or if she refuses to have sex with him. Finally, women are asked whether getting their husband's permission to get medical help for themselves is a major problem or not. While an alternative approach could be used to consider different types of decision-making separately, the results are not very different when doing so. The benefit of an overall index is that it provides a single summary measure of decision-making ability as well as the impact of child marriage on that measure. For more detailed work on decision-making, it is however recommended to also consider different types of decision-making separately.

⁶The approach is similar as to what was done for total fertility and child health. The impact of gender equality on decision-making ability for women is based on the following: (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; (4) the spousal age gap is reduced to five to nine years for women that have a spousal age gap of more than 10 years; and (5) several variables related to women's decision-making ability in the village or area where a specific woman lives are assumed to be improved.

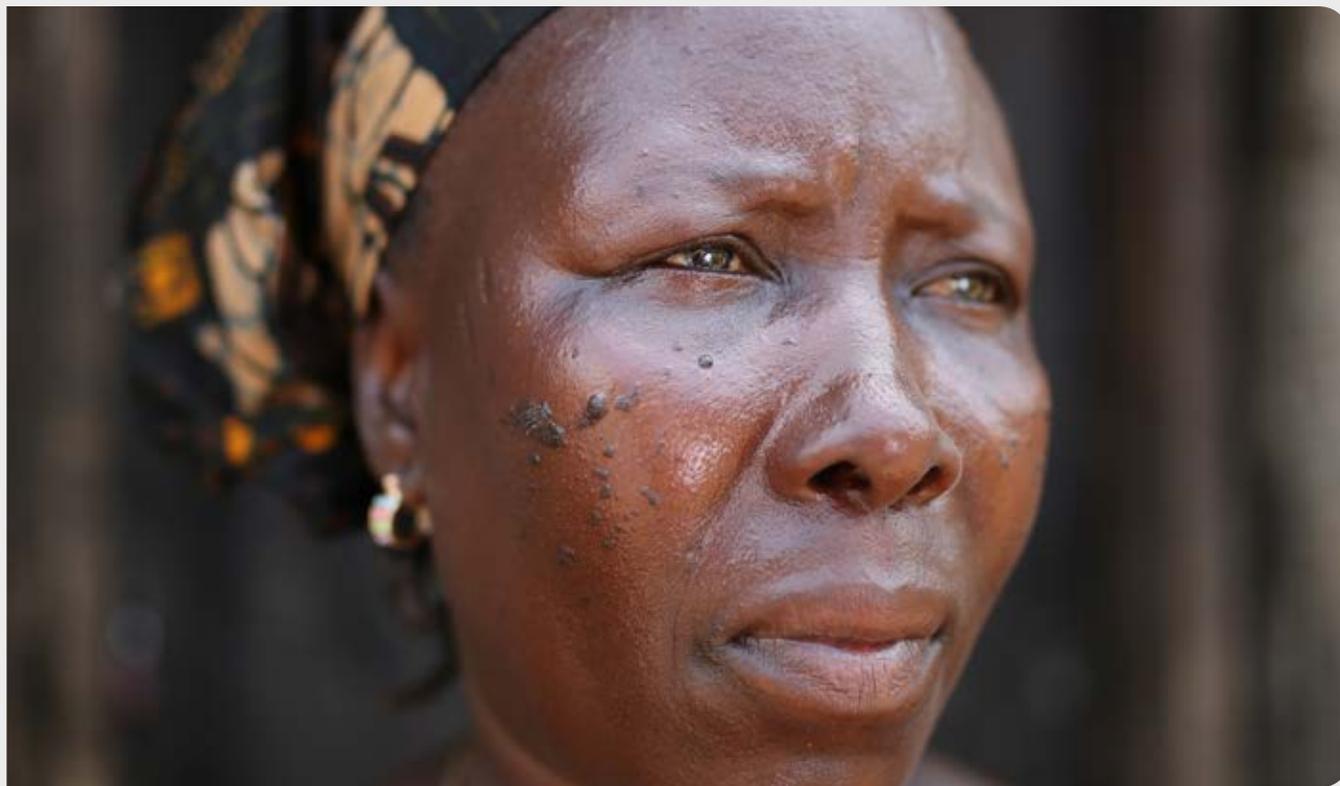
OTHER IMPACTS

Beyond the impacts estimated above, gender inequality is also associated with other negative effects for women. A few of those effects can be illustrated in the case of child marriage as a key component of gender inequality based on analysis for Uganda (World Bank, 2017).

- **Intimate Partner Violence:** The available data on intimate partner violence for Uganda suggests that levels of intimate partner violence (IPV) are high in comparison with other countries. There is evidence both in Uganda and in other countries that gender inequality is associated with higher risks of IPV. For example, multiple studies have suggested that child marriage may increase risks of IPV. In turn, the health implications of these impacts can be serious, as can be their cost implications for women and households. In Uganda, analysis suggests that child marriage contributes substantially to IPV. The impact of gender inequality, including its implications for educational attainment, is larger.
- **Knowledge of HIV/AIDS:** Gender inequality may also have an impact on women's knowledge about HIV/AIDS through its impact on education. Knowledge of HIV/AIDS is measured through an index that accounts for responses to a wide range of questions.

While child marriage does not affect the index in a statistically significant way, our analysis suggest that educational attainment does, and so does gender inequality. This matters given that young women are disproportionately impacted (HIV prevalence is almost four times higher among young women than men). Increased agency and education can help reduce risk of infection, as for example women are better able to negotiate condom use and protect themselves from rape and other forms sexual violence.

- **Birth registration:** Gender inequality could also affect birth registration for children. In some countries, when mothers have children below the minimum legal age for marriage, this could lead to lower birth registration rates if women are fearful that having a child at a young age suggests that marriage took place before the minimum legal age. More generally, there is clear evidence that birth registration is related among others to the mother's educational attainment, which itself is affected by gender inequality.





ECONOMIC IMPLICATIONS

These various impacts have implications for standards of living as well as the provision of public services. Consider the contribution of gender inequality to higher fertility and population growth. Simulations using demographic projection tools suggest that in Uganda, ending child marriage could reduce population growth by 0.17 percentage points under current conditions. When ending gender inequality as opposed to only ending child marriage, the impacts could be 25 to 30 percent higher according to estimations based on total fertility rates. Ending gender inequality could therefore lead to a reduction in population growth of about 0.22 percentage point. This reduction would be cumulative from year to year, since every year the annual rate of population growth would be lower than the rate under business as usual condition.

As a result, Uganda's population could be several percentage points smaller by 2030 if gender equality were achieved today. This would generate – all other things being equal, higher levels of wealth per capita since total wealth would not necessarily be affected at least in the short and medium term by the reduction in fertility rates, while the population growth rate and thereby the population size would decrease. A higher level of wealth per capita would in turn be beneficial for future standards of living. In economic terms, while the impact of gender equality from lower total fertility and population growth could be initially

smaller than the impact from lost earnings estimated in Table 2, over time the impact would increase and could become large.

Lower population growth from ending gender inequality could also reduce the cost for the government of providing basic services to the population. For example, as total fertility is reduced, the size of the cohorts of new students entering primary school would be reduced, leading to savings in service provision. The same applies to other services in multiple areas such as healthcare or basic infrastructure. Savings from a reduction in population growth could be used for investments in improving the quality of the services provided – or pay for the cost of policies aiming to achieve gender equality (such as universal secondary education for girls).

Finally, gender inequality also has implications for future generations. The analysis above suggests that gender inequality leads to an increase in the rates of under-five mortality and stunting. In the recent study on the impacts of child marriage in Uganda, valuations of these losses were provided. The valuations could be even larger for achieving gender equality.

CONCLUSION

The impacts of gender inequality on a wide range of development outcomes are large and the economic case for investing in girls and women is strong. Losses in human capital wealth in Uganda due to gender inequality are estimated at up to US\$61 billion. From its base value in 2014, Uganda's national wealth could increase by 11.8 percent under gender equality in earnings. On a per capita basis, this could generate a gain of up to US\$1,619 per person in wealth. Gender inequality also has large impacts in other areas, including fertility and population growth, under-five mortality and stunting, and women's decision-making ability within the household. In many of those areas, associated costs are likely to be high as well. This is for example the case for impacts on fertility and population growth which affect standards of living (GDP per capita as well as wealth per capita).

In separate publications at the World Bank, policy options to tackle gender inequality have been documented. For example, to increase women's earnings, investments throughout the life cycle are needed, starting with early childhood development and learning in schools, and continuing with improved job opportunities in adulthood. As noted in Wodon and de la Brière (2018), successful interventions can be implemented to address time use constraints, facilitate access to productive assets, and solving market and institutional failures that penalize women. Interventions need to be tailored in terms of age (young women face specific barriers and opportunities), poverty (very poor women need more than a single intervention) and type of workforce participation among women (considering wage workers, entrepreneurs and farmers). But smart delivery and implementation can lead to positive impacts. Addressing constraints often requires incentives and nudges, but what is also needed is to take on women's subordinate position in the family and the traditional division of labor for household chores and care.

While more work would be needed to adjust policy options to the specific context of Uganda, the good news is that achieving greater gender equality in labor markets and other areas would generate substantial economic gains for countries apart from a better life for women.

APPENDIX 1: METHODOLOGY FOR HUMAN CAPITAL WEALTH ESTIMATES

Human capital wealth is defined as the discounted 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, and results in estimates of human capital wealth by gender. Typically, women earn significantly less than 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 present 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 the estimation of human capital wealth 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 a very simple way. If we denote a country's human capital wealth as measured from the expected future earnings of women and men as HC_M and HC_W , respectively, and the adult population of men and women by POP_M and POP_W , the earnings per adult men and women can be defined as $hc_M = HC_M / POP_M$ and $hc_W = HC_W / POP_W$. Under gender equality, interpreted as ensuring that adult men and women have the same future expected earnings, human capital for women would increase from hc_W to hc_M . Therefore, the loss in human capital wealth from gender inequality is measured as $(hc_M - hc_W) \times POP_W$. Details are provided in Wodon (2018).

APPENDIX 2: CONCEPTUAL FRAMEWORK FOR ANALYZING THE IMPACTS OF GENDER INEQUALITY

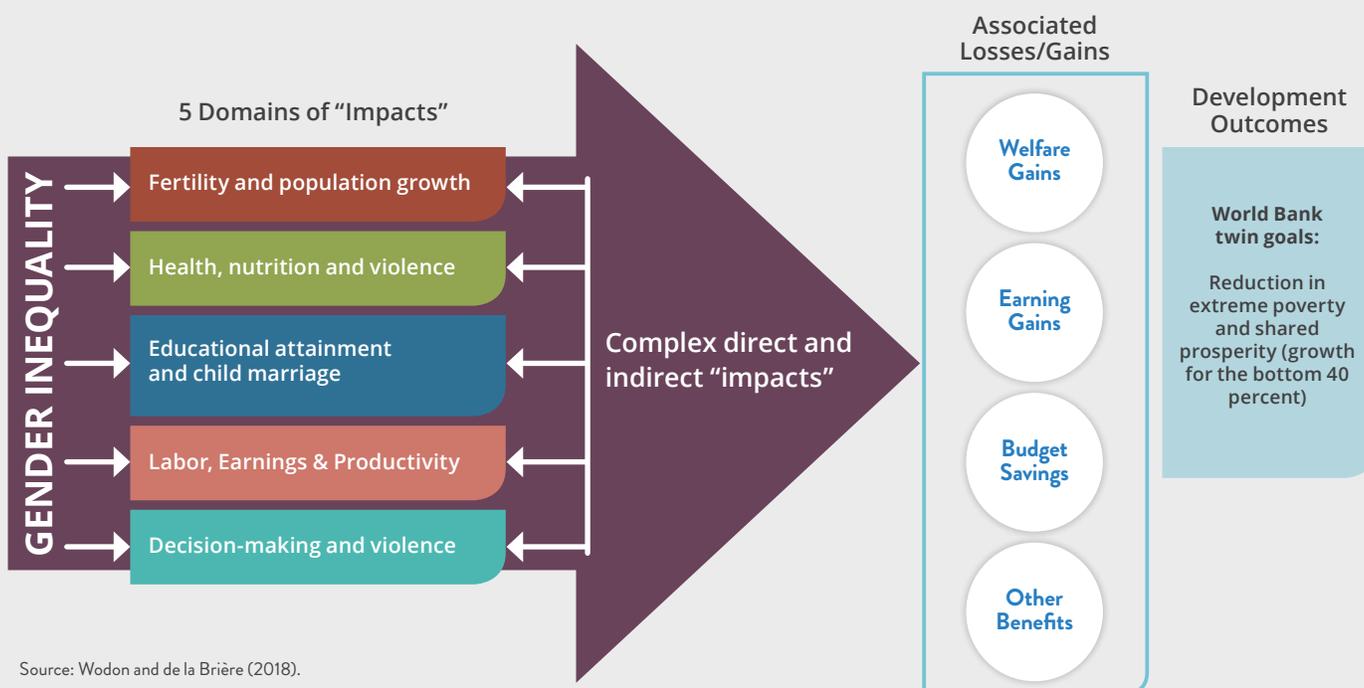
This note is part of a series that aims to measure the economic cost of gender inequality by looking at the impacts of gender inequality and the associated costs in multiple domains. The series also aims to provide a synthesis of the available evidence on successful programs and policies that have been shown to contribute to gender equality in multiple areas.

The framework for the analysis of the impacts and costs of gender inequality builds on recent work on the economic impacts of child marriage, low educational attainment for girls, and human capital wealth at the World Bank. Conceptually, five potential domains of impacts of gender inequality are considered, as shown in Figure 1: (1) fertility and population growth; (2) health and nutrition; (3) child marriage and educational attainment; (4) labor force participation and earnings; and (5) agency, including decision-making and the risk of gender-based violence.

Once impacts in various domains are estimated, costs can be measured for selected impacts. As shown in Figure 1, estimates of the monetary benefits from ending gender inequality can be computed among others in terms of (i) Higher growth in GDP per capita and lesser budgetary needs for service provision as a result of lower population growth; (ii) Higher labor earnings as a result of better health and less stunting in childhood; (iii) Higher labor earnings for women in adulthood (the focus of this note); and (iv) Benefits associated with children’s lives saved. This list is by no means exhaustive, but it includes some of the largest expected benefits.

Finally, the benefits from gender equality at the levels of individuals and households have broader implications. By raising standards of living (among others through higher GDP per capita with lower population growth and higher earnings for women), gender equality will reduce poverty. Since girls and women from lower socio-economic backgrounds are the most affected by gender inequality, promoting gender equality will also contribute to shared prosperity.

FIGURE A1: CONCEPTUAL FRAMEWORK FOR MEASURING THE COST OF GENDER INEQUALITY



Source: Wodon and de la Brière (2018).



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