THE COST OF GENDER INEQUALITY

—

UNREALIZED POTENTIAL: THE HIGH COST OF GENDER INEQUALITY IN EARNINGS

QUENTIN WODON AND BENEDICTE DE LA BRIERE

MAY 2018

Canada   CIFF CHILDREN'S INVESTMENT FUND FOUNDATION   GLOBAL PARTNERSHIP for EDUCATION   WORLD BANK GROUP

UNREALIZED POTENTIAL: THE HIGH COST OF GENDER INEQUALITY IN EARNINGS

QUENTIN WODON AND BENEDICTE DE LA BRIERE

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 first note in the series on the cost of gender inequality focuses on the losses in national wealth due to gender inequality in earnings. 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 typically resides in their people. As noted in the recent World Bank study on the Changing Wealth of Nations (Lange et al., 2018), human capital measured as the present value of the future earnings of the labor force accounts for two thirds of global wealth. If gender equality in earnings were achieved, countries could increase their human capital wealth, and thereby their total wealth substantially. This would enable them to strengthen the sustainability of their development path. Specifically, key findings from this note are as follows:

- Globally, women account for only 38 percent of human capital wealth versus 62 percent for men. In low- and lower-middle income countries, women account for a third or less of human capital wealth.

- On a per capita basis, gender inequality in earnings could lead to losses in wealth of $23,620 per person globally. These losses differ between regions and countries because levels of human capital wealth, and thereby losses in wealth due to gender inequality, tend to increase in absolute values with economic development. For these reasons, in absolute terms the losses are largest in OECD countries.

- Globally, for the 141 countries included in the analysis, the loss in human capital wealth due to gender inequality is estimated at $160.2 trillion if we simply assume that women would earn as much as men. This is about twice the value of GDP globally. Said differently, human capital wealth could increase by 21.7 percent globally, and total wealth by 14.0 percent with gender equality in earnings.

- These estimates of the losses from gender inequality are related only to differences in lifetime labor earnings and therefore human capital wealth between women and men. Many other costs are associated with gender equality apart from those estimated in this particular note. Subsequent notes in this series will estimate those other losses.

- 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 women's earnings and 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 both women and men have equal access to opportunities and resources.

- A review of the literature suggests that successful interventions can be implemented in multiple areas to improve employment opportunities and earnings for women. This includes: (i) reducing time spent in unpaid work (notably subsistence and household work) and redistributing care responsibilities; (ii) increasing access to and control over productive assets (particularly land, credit, insurance and savings but also key skills); and (iii) addressing market and institutional failures (access to information and networks, legal and fiscal impediments, and restrictive social norms).

- Ending gender inequality by investing in girls and women is essential to increase the changing wealth of nations and enable countries to develop in sustainable ways. This makes economic sense and it is the right thing to do.

INTRODUCTION: WEALTH AND THE COST OF GENDER INEQUALITY

Gender inequality has major economic implications for women, communities, and countries in a range of areas (see the framework used for this series of notes in Appendix 1). While the cost of gender inequality – in terms of human capital losses - for development is not solely due to losses in earnings, the impact of gender inequality on earnings is key. This is the area on which this note focuses. Typically, researchers looking at the impact of gender inequality on development have 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 the potential 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.

In this note, 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). 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.

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. As already mentioned, countries' economic development has traditionally been assessed through GDP per capita, a measure of the income produced by a nation in a given year. Similarly, economic performance has been traditionally assessed through growth in GDP per capita. This is perhaps why most studies of the impact of gender inequality on earnings have focused on GDP. But with which resources is GDP produced? 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 considered the three main components of the changing wealth of nations, that together with net foreign assets, provide the assets base that countries rely on 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 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.

BASELINE ESTIMATES OF GLOBAL WEALTH

The methodology for estimating human capital wealth as well as the losses due to gender inequality is explained in Appendix 2. Before presenting results on losses in wealth due to gender inequality, this section presents baseline estimates of human capital and total wealth from Lange et al. (2018). Table 1 provides global estimates in absolute value and per capita terms. The analysis is based on data for 141 countries accounting for more than 95 percent of the world's population. 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.

Global wealth stood at $1,143 trillion in 2014. This represented an increase in real terms of 66 percent over 20 years (average annual growth rate of 2.6 percent per year). Human capital wealth reached $737 trillion in 2014, an increase of 55 percent since 1995 (average annual growth rate of 2.2 percent). 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 $168,580 per person in 2014 versus $128,929 in 1995. Human capital wealth stood at $108,654 per person in 2014 versus $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 $700,000, and human capital wealth is at close to $500,000 per person. This is more than 90 times the levels in low income countries where human capital wealth is at $5,564 per person.

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. Many of these countries are experiencing a demographic transition, and are reaping the benefits of the demographic dividend as population growth rates slow, and the population is becoming better educated. While substantial progress has been achieved to close gender gaps in educational attainment at the primary level, the returns to education are often larger at higher levels of schooling. At those levels, gender gaps in educational attainment remain, especially in low income countries. Furthermore, as countries achieve higher levels of economic development, human capital wealth dominates. At lower levels of economic development, natural capital continues to account for a larger share of wealth.

Table 1: Baseline Estimates of Global Wealth, 1995-2014

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

GLOBAL LOSSES FROM GENDER INEQUALITY

Estimations of human capital wealth are done separately for men and women (see the appendix to this note and Wodon, 2018, for details). Losses in human capital wealth due to gender inequality are calculated in a simple way. Denote a country's human capital wealth from men's and women's expected future earnings as HC_M and HC_W, respectively. The adult population of men and women are denoted by POP_M and POP_W. Human capital wealth per adult man and woman are defined as $hc_M = HC_M/POP_M$ and $hc_W = HC_W/POP_W$. Gender equality is assumed when adult men and women achieve the same future expected earnings. In other words, in countries where hc_W is below hc_M (this is virtually the case for all countries), human capital for women would increase to reach hc_M. The loss in human capital wealth from gender inequality is measured as $(hc_M - hc_W) \times POP_W$[1]. As discussed in Box 1, there are clear limitations to this approach, but the approach has the merit of being simple and it helps in providing an order of magnitude for the losses in human capital potentially associated with gender inequality.

Table 2 provides estimates of the shares of human capital wealth for women today globally and the losses in human capital wealth due to gender inequality. Globally, in 2014 women accounted for 38 percent of human capital wealth versus 62 percent for men. These are also essentially the proportions observed for upper middle and high-income OECD countries which account for the bulk of human capital wealth. In low income and lower-middle income countries, women account for only a third or less of human capital wealth. In those countries, gender inequality thus generates in proportional terms a larger loss in human capital wealth, and thereby in total wealth, as will be discussed further below.

How large are the potential losses in wealth resulting from gender inequality globally? As shown in Table 2, women's human capital could increase from $283.6 trillion to $453.2 trillion with gender equality. This represents a potential loss in global wealth of $160.2 trillion. The estimated increase in human capital wealth from the base is 21.7 percent in 2014, and for total wealth (including natural and produced capital as well as net foreign assets), the increase in wealth is estimated at 14.0 percent. On a per capita basis (including not only the adult population but also children), gender inequality could lead to a loss in wealth of $23,620 per person. These potential losses are clearly large. They

[1] In very rare cases when hc_W is larger than hc_M, we could raise hc_M to the level of hc_W, but for standardization we instead adjust hc_W downwards. These rare cases do not make any meaningful difference to the overall results however.

underscore the benefits that could be reaped globally from achieving gender equality.

Over time, the estimate of the total wealth lost due to gender inequality increases from $123.2 trillion in 1995 to $160.2 trillion in 2014, which is about twice the value of global GDP. 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, including factors that affect the share of labor earnings in GDP over time.

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

equality 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 in turn contributes to a small reduction of the losses from gender inequality over time as a share of the baseline wealth estimates.

How do our results compare to previous studies? Comparisons can be made 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 magnitude of the losses associated with gender inequality.

BOX 1: 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 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 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 countries would 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 considered an upper bound of the losses from gender inequality, because 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. However, the estimation could also be a lower bound of the losses. Indeed, higher earnings for women could lead to more economic activity with positive multiplier effects on the economy and thereby 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 even larger earnings and human capital gains for both men and women than suggested in this note. We also do not account for intergenerational benefits from unleashing women's earnings potential through better education, health, and employment opportunities for their children.

In subsequent work on the cost of gender inequality, we will explore these issues in more details to look at potential paths for countries to end gender inequality and the implications that these paths may have through general equilibrium effects for the estimates of the losses from gender inequality.

- **Gender shares:** Previous studies have focused on gender shares in GDP, while we estimate gender shares in human capital wealth. Still, given that both approaches are based on earnings data, they should generate similar gender shares. This is indeed the case. The gender shares of GDP reported by the McKinsey Global Institute (2015) are similar to ours[2]. 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 (2017). Broadly, there is alignment at least at the global and regional levels[3].

- **Magnitude of the losses:** The McKinsey Global Institute (2015) study reports potential gains in GDP from a 'full potential' scenario of $28 trillion or 26 percent of GDP in 2025 versus a 'business-as-usual' scenario without gender equality[4]. We report losses in human capital wealth from gender inequality of $160 trillion or 14 percent of our baseline estimate of global wealth. Our estimate is larger in absolute value simply because wealth is larger than GDP. In 2014, global wealth is estimated at $1,143 trillion for the 141 countries included in our analysis, while global GDP for those countries is estimated at $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 the potential losses from gender inequality as opposed to very precise values, and both types of estimates suggest that the losses from gender inequality are indeed very large.

Table 2: Global Losses in Wealth from Gender Inequality, 1995-2014

	1995	2000	2005	2010	2014
	Global wealth, Trillions, constant 2014 $				
Baseline gender shares of human capital					
Men's share of human capital	63%	63%	62%	61%	62%
Women's share of human capital	37%	37%	38%	39%	38%
Human capital wealth by gender					
Human capital, men	301.2	349.1	371.6	405.5	453.2
Human capital, women	174.4	203.6	223.8	255.6	283.6
Loss from gender inequality					
Counterfactual human capital, women	297.6	344.5	366.4	398.4	443.8
Increase in human capital	123.2	140.9	142.6	142.8	160.2
Loss as share of baseline human capital	25.9%	25.5%	24.0%	21.6%	21.7%
Loss as share of baseline total wealth	17.9%	17.8%	16.0%	13.9%	14.0%
	Per capita wealth, constant 2014 $				
Baseline global wealth					
Human capital per capita, men	56,290	60,940	60,980	62,672	66,832
Human capital per capita, women	32,584	35,538	36,727	39,498	41,823
Loss from gender inequality					
Loss in human capital per capita	23,030	24,603	23,391	22,068	23,620

Source : Wodon (2018).

[2]Our estimate of women's share of human capital wealth at 38 percent globally in 2014 is close to McKinsey's estimate of women's contribution to GDP at 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.

[3]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.

ANALYSIS BY REGIONS

The losses in human capital wealth from gender inequality differ between regions and between countries classified by broad income groups. Tables 3 provides the estimates for overall losses in human capital wealth and wealth per capita for seven regions: East Asia and the Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, North America, South Asia, and finally sub-Saharan Africa.

Consider the estimates for 2014. The largest total 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 $40 trillion and $50 trillion. 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. In per capita terms as well, the losses are larger in those regions. But the losses in other regions are substantial too, including in comparison to current levels of development. For example, in South Asia, the losses from gender inequality are estimated at $9.1 trillion. In sub-Saharan Africa, the losses are at $2.5 trillion. This is the smallest estimate across regions. However, as a share of initial wealth, the losses from gender inequality in sub-Saharan Africa represent 11.4 percent of the base regional wealth, which is 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 loss in total wealth from the base with gender inequality is highest in South Asia, because this is also the region with the lowest initial share of women in human capital.

ANALYSIS FOR COUNTRIES AT DIFFERENT LEVELS OF DEVELOPMENT

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). In this section, we differentiate between high income OECD and other high-income countries. The latter group includes several oil-producing countries from the Middle East. Table 4 provides the estimates for these five income groups.

Consider again the estimates for 2014. In absolute terms, the largest total losses in wealth are observed for high income OECD countries and upper-middle income countries (which include China). Together these two groups of countries experience a loss of $140.2 trillion in human capital wealth due to gender inequality. The other countries together lose $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 as shown in Table 2. 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 Global Institute 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 3: Losses from Gender Inequality by Region, 1995-2014

	1995 ($ 2014)	2000 ($ 2014)	2005 ($ 2014)	2010 ($ 2014)	2014 ($ 2014)
East Asia & Pacific					
Loss in human capital ($ trillions)	34.2	35.8	37.7	42.1	49.9
Loss in human capital per capita ($)	18,627	18,450	18,663	20,130	23,253
% loss in total wealth	24.5%	22.1%	20.8%	17.1%	16.6%
Europe & Central Asia					
Loss in human capital ($ trillions)	32.4	36.3	37.2	38.8	41.6
Loss in human capital per capita ($)	39,892	44,511	45,045	46,261	48,884
% loss in total wealth	14.3%	14.8%	13.7%	13.0%	13.3%
Latin America & Caribbean					
Loss in human capital ($ trillions)	7.3	5.9	6.5	6.7	6.7
Loss in human capital per capita ($)	15,500	11,558	11,945	11,468	10,940
% loss in total wealth	14.3%	10.5%	10.2%	8.8%	7.9%
Middle East & North Africa					
Loss in human capital ($ trillions)	1.6	2.1	2.4	2.7	3.1
Loss in human capital per capita ($)	9,275	11,261	11,220	11,150	11,757
% loss in total wealth	10.2%	11.8%	9.9%	7.7%	7.4%
North America					
Loss in human capital ($ trillions)	43.4	55.1	51.3	43.3	47.2
Loss in human capital per capita ($)	146,791	175,923	156,600	126,052	133,299
% loss in total wealth	18.8%	19.5%	16.3%	13.3%	13.5%
South Asia					
Loss in human capital ($ trillions)	3.3	4.6	6.5	7.4	9.1
Loss in human capital per capita ($)	2,664	3,383	4,374	4,613	5,405
% loss in total wealth	28.8%	32.2%	35.0%	29.4%	29.4%
Sub-Saharan Africa					
Loss in human capital ($ trillions)	1.1	1.1	1.0	1.9	2.5
Loss in human capital per capita ($)	2,016	1,927	1,435	2,480	2,914
% loss in total wealth	7.6%	8.8%	6.3%	9.8%	11.4%

Source : Wodon (2018).

Absolute losses in human capital wealth 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. Is there convergence over time in estimates of human capital wealth for women across countries? Figure 1 displays a scatter plot for the levels of women's human capital wealth per capita in 1995 (on the horizontal axis) and in 2014 (on the vertical axis). Since estimates are in logarithms, the difference between the values for 2014 and the diagonal represents approximately the cumulative growth observed over two decades.

Most countries lie above the diagonal, suggesting that an overwhelming majority of countries benefited from an increase in human capital wealth per capita for women between 1995 and 2014. However, a few countries have lost ground, often due to a conflict or other shock. In addition, growth rates in human capital for women tend to be higher for lower income countries. Indeed, observations in the scatter plot for lower income countries tend to be located further away from the diagonal than for higher income countries. There appears to be some level of convergence in human capital wealth for women with poorer countries (slowly) catching up, although this is not always the case (see Box 2 for a more detailed discussion).

The fact that low income countries lie so far behind high income countries in levels of human capital wealth suggests that programs and policies are needed to raise the earnings potential of women (and men). Many of the programs and policies discussed in the next two sections have the potential not only to move countries closer to equality in earnings between men and women, but also to raise those earnings more generally.

Table 4: Losses from Gender Inequality by Income Group, 1995-2014

|	1995 ($ 2014)	2000 ($ 2014)	2005 ($ 2014)	2010 ($ 2014)	2014 ($ 2014)
Low income countries					
Loss in human capital ($ trillions)	0.4	0.5	0.6	0.8	1.1
Loss in human capital per capita ($)	1,335	1,406	1,415	1,675	2,052
% loss in total wealth from base	11.5%	13.5%	13.8%	14.2%	15.1%
Lower-middle income countries					
Loss in human capital ($ trillions)	6.8	7.6	9.4	11.0	13.5
Loss in human capital per capita ($)	3,407	3,472	3,958	4,275	4,967
% loss in total wealth from base	19.2%	20.7%	20.4%	18.1%	19.1%
Upper-middle income countries					
Loss in human capital ($ trillions)	11.2	11.3	16.1	20.9	26.5
Loss in human capital per capita ($)	6,032	5,764	7,872	9,800	12,067
% loss in total wealth from base	11.8%	10.0%	11.9%	10.4%	10.7%
High income non-OECD					
Loss in human capital ($ trillions)	2.7	3.6	3.8	4.7	5.4
Loss in human capital per capita ($)	10,637	14,047	14,378	17,021	18,672
% loss in total wealth from base	6.5%	8.6%	7.4%	7.1%	7.0%
High income OECD					
Loss in human capital ($ trillions)	102.2	117.9	112.6	105.4	113.7
Loss in human capital per capita ($)	108,593	121,735	112,859	102,567	108,631
% loss in total wealth from base	19.8%	19.8%	17.3%	15.2%	15.3%

Source: Wodon (2018).

INVESTING IN HUMAN CAPITAL THROUGHOUT THE LIFE CYCLE

Why are there large differences between men and women in human capital wealth? The reasons are multiple, but in a stylized fashion, two factors probably stand out. First, men have higher labor force participation rates than women and they tend to work more hours in paid work. Women tend to work on average more hours than men overall, but a much 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. Although there has been progress towards reducing inequality in educational attainment between boys and girls over the last two decades, part of the gender wage gap for adults is also due to differences in educational attainment between men and women, which are often themselves due in part to deeply entrenched social norms (see Box 3 on child marriage as an example which continues to be highly relevant today). But other factors also play a role, including gender discrimination in labor markets and occupational sex segregation which are themselves driven in part by social norms. While gender gaps in education have been reduced in recent decades, these other factors leading to gender gaps in earnings remain prevalent.

While programs and policies that could reduce the wage gap by sex in terms of both earnings and labor force participation are discussed in the following section and will also be detailed in subsequent notes, it may be useful to outline first how broader investments in women (and men) along the life cycle could help boost human capital wealth accumulation more generally. A particular emphasis is needed on interventions from (pre-)birth to adolescence.

FIGURE 1: CONVERGENCE IN WOMEN'S HUMAN CAPITAL WEALTH PER CAPITA

Human Capital Wealth Per Capita in 2014 (Log, US$ 2014)

Human Capital Wealth Per Capita in 1995 (in Log, US$)
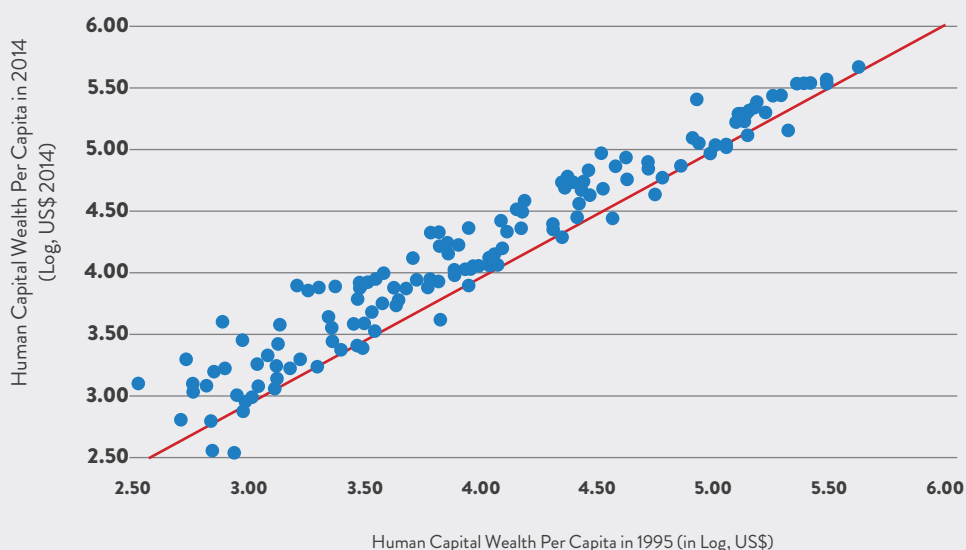
BOX 2: CONVERGENCE AND OTHER FACTORS AFFECTING HUMAN CAPITAL WEALTH

Growth models can be estimated to analyze factors that may affect human capital wealth. In Nayihouba and Wodon (2018), the dependent variables are the growth rates in human capital wealth per capita estimated separately for women and men. Apart from the initial level of human capital wealth, independent variables include the average years of schooling of the adult population and life expectancy at birth, as well as other variables related to trade, government spending, investment, and inflation. Given that the theoretical model predicts that the growth rate of the population, the working age population, and the labor force may all affect human capital wealth per capita, these variables are also included in the regressors.

The results suggest convergence in that countries with lower levels of human capital wealth tend to have higher growth rate. Higher rates of population growth are associated with slower growth in human capital wealth, while growth in the labor force has the opposite effect. Average years of schooling and life expectancy also have a positive effect on growth in human capital wealth per capita. When adding macroeconomic variables, familiar results are obtained, in that inflation is associated with slower rates of growth of human capital wealth, while open economies are associated with higher growth when effects are statistically significant. None of these results are surprising, but they point to the importance of investments in education and health and to the role that demographic factors and labor markets play.

How can the earnings potential and thereby the human capital wealth of women be increased? A few years ago, the World Bank (2010) developed a simple conceptual framework—Skills Toward Employment and Productivity or STEP — to help policymakers, analysts, and researchers think about interventions that could enhance labor productivity and growth. Given that human capital wealth is based on measures of earnings, the framework, while not specific to women, is relevant. The framework focuses on five interlinked steps in a person's life during which it makes sense to invest in human capital for better jobs and productivity:

- **Step 1. Getting children off to the right start**—by developing the cognitive, emotional, and behavioral skills conducive to high productivity and flexibility in the work environment through early child development (ECD), emphasizing nutrition, stimulation, and basic cognitive skills, all of which are affected by gender norms early on in life. Research shows that handicaps built early in life – for example in the case of chronic malnutrition, are difficult to remedy later and that effective ECD programs can have a very high payoff. In some countries in South Asia for example, gender gaps already appear in ECD, as is the case when chronic malnutrition (stunting) rates are higher for girls than for boys.

- **Step 2. Ensuring that all students learn**—by building stronger systems with clear learning standards, good teachers, adequate resources, and a proper regulatory environment. As noted in the recent World Development Report on education (World Bank, 2017), much of the world is experiencing a learning crisis. Key decisions about education systems involve how much autonomy to allow and to whom, accountability from whom and for what, and how to assess performance and results, including by paying attention to gender gaps not only in educational attainment, but also in learning performance for specific subjects and reducing unconscious bias in curricula.

- **Step 3. Building job-relevant skills that employers demand**—by developing the right incentive framework for both pre-employment and on-the-job training programs and institutions (including in higher education). Successful experiences show that public and private efforts can be combined to achieve relevant and responsive training systems. Gender gaps in specific skills must be addressed, especially at the secondary and tertiary levels where girls are less likely than boys to specialize in topics related to STEM (Science, Technology, Engineering and Mathematics). This should help reduce occupational segregation and increase productivity.

BOX 3: LOSSES IN EARNINGS AND HUMAN CAPITAL WEALTH DUE TO CHILD MARRIAGE

Child marriage is defined as a marriage or union before the age of 18. The practice affects mostly girls. It has been declining over time, but especially in sub-Saharan Africa, many girls continue to marry as children (Le Nestour et al., 2018). Child marriage has negative impacts on a wide range of outcomes and therefore large economic costs. In the case of earnings, the impact of child marriage on labor force participation may not be very large. However, because child marriage leads girls to drop out of school, it affects expected earnings.

Savadogo and Wodon (2018) suggest that controlling for other factors, child marriage leads to a loss in earnings for women in adulthood of nine percent on average for women who married as children in 15 countries with relatively high levels of child marriage. Most of these losses are due to lower educational attainment as opposed to higher fertility rates which may affect labor force participation. Given that human capital wealth estimates are based on expected earnings, child marriage also leads to substantial losses in human capital wealth.

- **Step 4. Encouraging entrepreneurship and innovation**—by creating an environment that encourages investments in knowledge and creativity. Evidence suggests that this requires innovation-specific skills (which can be built starting early in life) and investments to help connecting people with ideas (say, through collaboration between universities and private companies) as well as risk management tools to facilitate innovation. Lack of networks and knowledge are important constraints for female entrepreneurship, as is limited access to finance. Women-led enterprises also tend to be concentrated in the retail and service sectors where profits and growth opportunities are lower, and rarely in mining, construction, electronics or software, for example.

- **Step 5. Matching the supply of skills with the demand**— by moving toward more flexible, efficient, and secure labor markets. Avoiding rigid job protection regulations while strengthening income protection systems, complemented by efforts to provide information and intermediation services to workers and firms, is the final complementary step transforming skills into actual employment and productivity. This also has gender implications as narrow solutions focusing only for example on the supply of skills are rarely effective; multi-dimensional comprehensive approaches considering both supply and demand are required.

This simple framework emphasizes that investments throughout a person's life are needed to create human capital wealth, and thereby ensure that individuals have adequate

livelihoods. In the next section, the emphasis is on lessons learned from a brief literature review on interventions that have proven successful in enabling women to acquire and keep good jobs, whether as employees or through self-employment.

IMPROVING EMPLOYMENT OPPORTUNITIES FOR WOMEN: LESSONS FROM THE LITERATURE

Within an economic analysis framework, a woman's decision to participate in the labor force is fundamentally determined by two sets of factors: those that affect her reservation wage – the wage at which she is willing to enter the labor market, and those that affect the wage she can earn in the market (Winkler, 2016). The reservation wage varies directly with the availability of market substitutes for household production and technology; inversely with the husband's (or other earners') income; and is affected by the presence of children and broader social norms regarding fertility, appropriate roles of women and men, and decision-making. A woman's wage in the market depends on her human capital, her labor force experience, especially her firm-specific human capital, and the existing demand for her labor. 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 non-economic ones (political ideology, religion, 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 potentially difficult reallocation of time between paid employment and other activities as well as persistent and pervasive gender differences in productivity and earnings across different sectors and jobs. Men's and women's jobs differ across sectors, occupations, types of jobs, and firms.

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). These differences may affect all women, whether they are wage workers, farmers, or self-employed workers/entrepreneurs. These differences also often mutually reinforce each other and lead to productivity traps for women. This is costly not only for them, but also to their household, their community, and society as the estimates of the losses in human capital wealth from gender inequality shown earlier demonstrate. In addition, these differences represent a serious disincentive to investments in the women of tomorrow.

This section discusses some of the policies that could help reduce the inequality in lifetime earnings between men and women. Given limitations of space, the objective is not to be exhaustive, but rather to point to some of the findings emerging from the literature on what works to reduce gender inequality, acknowledging that various policies may be more relevant in some countries than in others. Examples of potential policies to be adapted to country context are provided in Table 5.

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 from 19 countries (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). Recognizing, 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, Reimo et al. (2017) review 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

Table 5: Examples of Interventions to Address Constraints on Women's Paid Work

Constraints/Type of work	Wage employees	Farmers	Entrepreneurs/Self-employed
1. 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 employerprovided childcare		
Laws & technology	Workplace flexibility including parental leave	Time saving technology	Time saving technology
2. Access to productive assets			
Land	-	Joint titling	-
Skills	Bundled training (technical and managerial) including socio-emotional skills (persistence), 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 payments 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		
3. 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: Authors.

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 (through education campaigns, increased law enforcement, and public-sector unions) 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, 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. Work place flexibility, either through part-time work, flexible hours, compressed schedules ("flextime") or through telecommuting/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 may face larger 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 counterparts 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. 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.

CONCLUSION

The objective of this first note in a series on the cost of gender inequality was twofold: (i) to demonstrate the economic cost from gender inequality in the case of earnings and human capital wealth; and (ii) to review some of the broad policies and specific interventions that could help achieve greater equality. The economic case for investing in girls and women is now very strong. Losses in human capital due to gender inequality are estimated at $160.2 trillion. On a per capita basis, gender inequality generates losses in wealth of $23,620 per person. By contrast, gender equality would raise the (changing) wealth of nations by 14.0 percent globally. The losses differ between regions and income groups since levels of human capital wealth also differ.

To increase women's earnings and human capital wealth, investments throughout the life cycle are needed, starting with early childhood development and learning in schools, and continuing with improved job opportunities in adulthood. The literature reviewed in this note was focused on job opportunities (other notes in the series will discuss earlier investments). 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 participation (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 in many contexts.

Finally, it must be emphasized that the estimates of the losses from gender inequality provided in this note relate only to lifetime labor earnings and human capital wealth for women. Many other economic benefits would arise from gender equality apart from those estimated in this note. The good news is that achieving greater gender equality in labor markets and other areas will generate substantial economic gains for countries apart from a better life for women.

APPENDIX 1: CONCEPTUAL FRAMEWORK FOR ESTIMATING IMPACTS AND COSTS

This series of notes aims to measure the economic cost of gender inequality globally and regionally 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 impacts and costs 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, the series will focus on five potential domains of impacts of gender inequality, as shown in Figure A1: (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. The impacts of gender inequality in these areas will be estimated. This note focuses on labor force participation and earnings using human capital wealth data for the estimation. Future notes in the series will look at other domains of impacts.

Once impacts in various domains are estimated, costs can be measured. As shown in Figure 1, the notes will provide estimates of the monetary benefits from ending gender inequality 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 of benefits is by no means exhaustive, but it includes some of the largest benefits that can be expected.

Finally, as also suggested in Figure 1, the benefits from gender equality at the levels of individuals and households have broader implications at the national and even global levels. 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.

Apart from providing estimates of the impacts of gender inequality on various development outcomes and the costs associated with these impacts, the notes in this series will also review the available evidence on what works to promote gender equality in various domains, as done in this note for policies related to employment opportunities for women. Building on this series of notes, a comprehensive report will be prepared to summarize the main findings as they pertain to the various domains of impacts, costs, and policy interventions.

Source: Adapted from Wodon (2017).
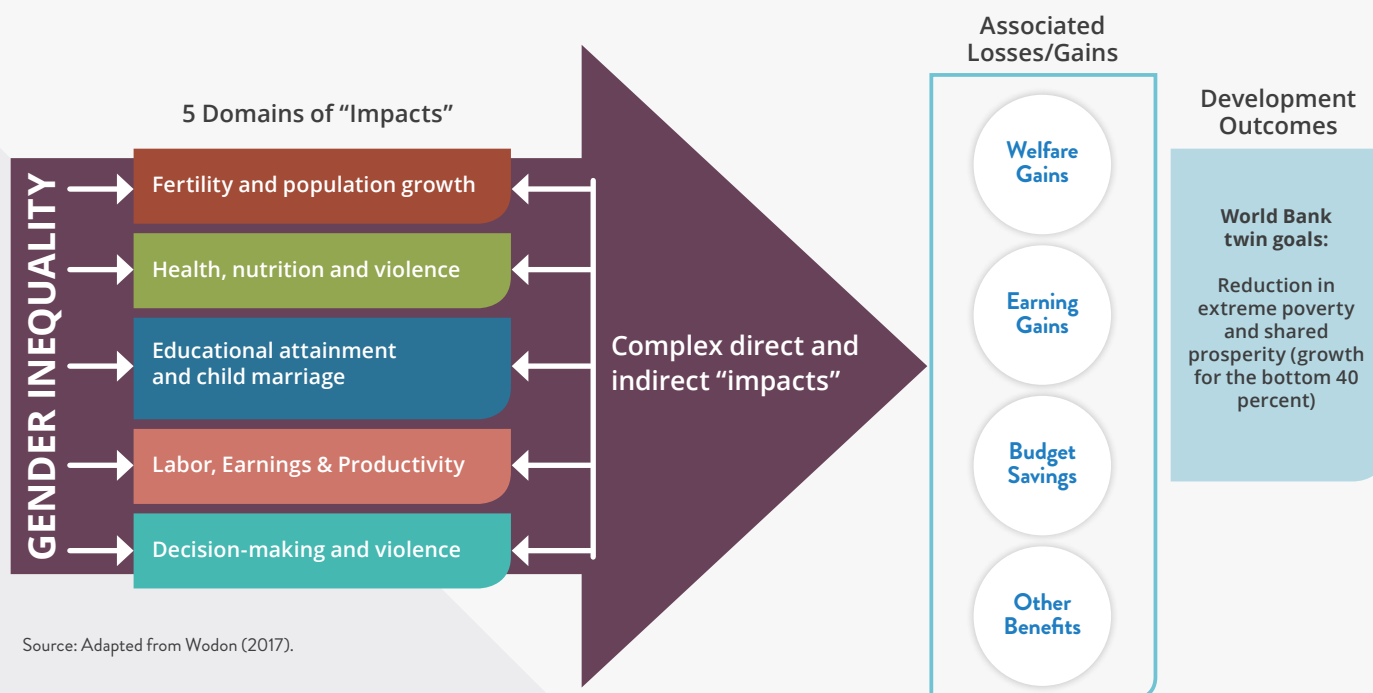
APPENDIX 2: METHODOLOGY FOR HUMAN CAPITAL WEALTH ESTIMATES

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).

REFERENCES

Accenture and International Finance Corporation. 2018. *Driving Toward Equality: Women, Ride-hailing, and the Sharing Economy*. Washington, DC: International Finance Corporation.

Aizer, A. 2010. The Gender Wage Gap and Domestic Violence. *American Economic Review* 100 (4) 1847-59.

Ali, D. A., K. Deininger, and M. Goldstein. 2014. Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda. *Journal of Development Economics* 110: 262-75

Amaral, S., S. Bandyopadhyay, and R. Sensarma. 2015. Public Work Programs and Gender-based Violence: The Case of NREGA in India. Birmingham University, Department of Economics Discussion Paper 15-09.

Banerjee, A., D. Karlan, and J. Zinman. 2015. Six randomized evaluations of micro-credit: Introduction and Further Steps. *American Economic Journal: Applied Economics* 7(1) 1-21.

Black, D., N. Kolesnikova, and L. Taylor. 2014. Why Do So Few Women Work in New York (And So Many in Minneapolis)? Labor Supply of Married Women across U.S. Cities. *Journal of Urban Economics* 79: 59-71.

Blackden, M., and Q. Wodon, 2006. *Gender, Time Use, and Poverty in sub-Saharan Africa*. World Bank Working Paper No. 73, Washington, DC: The World Bank.

Brody, C., T. de Hoop, M. Vojtkova, R. Warnock, M. Dunbar, P. Murthy, and S. Dworkin. 2015. Economic Self-Help Group Programs for Improving Women's Empowerment: A Systematic Review. *Campbell Systematic Reviews* 11, no 19.

Buvinic, M. and M. O'Donnell. 2016. Revisiting What Works: Women, Economic Empowerment and Smart Design. Washington, DC: CGD, Data 2X, and United Nations Foundation.

Campos, F., M. Goldstein, L. McGorman, A. M. Munoz Boudet and O. Pimhidzai. 2015. Breaking the Metal Ceiling: Female Entrepreneurs Who Succeed in Male-dominated Sectors in Uganda. Africa Gender Innovations Lab. Washington, DC: The World Bank.

Campos, F. and M. Gassier. 2017. Gender and Entreprise Development in Sub-Saharan Africa. A Review of Constraints and Effective Interventions. World Bank Policy Research Working Paper 8239. Washington, DC: The World Bank.

Cuberes, D. and M. Teignier. 2015. How Costly Are Labor Gender Gaps? Estimates for the Balkans and Turkey. World Bank Policy Research Working Paper 7319. Washington, DC: The World Bank.

Elborgh-Woytek, K., M. Newiak, K. Kochhar, S. Fabrizio, K. Kpodar, P. Wingender, B. Clements, and G. Schwartz. 2013. Women, Work and the Economy: Macroeconomic Gains from Gender Equity. IMF Staff Discussion Note. Washington, DC: International Monetary Fund.

Estache, A. and Q. Wodon. 2014. *Infrastructure and Poverty in sub-Saharan Africa*. New York and London: Palgrave Macmillan.

Grown, C. and I. Valodia (eds). 2010. Taxation and Gender Equity. A Comparative Analysis of Direct and Indirect taxes in Developing and Developed Countries. IDRC, Routledge.

Hoeffler, A. and J. Fearon. 2014. *Benefits and Costs of the Conflict and Violence Targets for the Post-2015 Development Agenda. Copenhagen Consensus Center.*

International Finance Corporation, Axxa and Accenture. 2015. She for Shield: Insure Women to Better Protect All. Washington, DC: International Finance Corporation.

International Finance Corporation. 2017. *Tackling Childcare: The Business Case for Employer-supported Chidcare*. Washington, DC: International Finance Corporation.

Jorgensen, D.W. and B.M. Fraumeni. 1992a. The Output of Education Sector, in Z. Griliches (ed.). *Output Measurement in the Service Sectors*. Chicago, IL: University of Chicago Press.

Jorgensen, D.W. and B.M. Fraumeni. 1992b. Investment in Education and US Economic Growth. *Scandinavian Journal of Economics*, 94(Supplement): 51–70.

Lange, G. M., Q. Wodon, and K. Carey. 2018. *The Changing Wealth of Nations 2018: Sustainability into the 21st Century.* Washington: The World Bank.

Le Nestour, A., O. Fiala, and Q. Wodon. 2018. Global and Regional Trends in Child marriage. Mimeo. London and Washington, DC: Save the Children and The World Bank.

Lenze, J. and S. Klasen. 2017. Does Women's Labor Force Participation Reduce Domestic Violence: Evidence from Jordan. *Feminist Economics* 23(1): 1-29.

McKinsey Global Institute. 2015. *The Power of Parity: How Advancing Women's Equality Can Add $12 Trillion to Global Growth*. London: McKinsey Global Institute.

Nayihouba, A. and Q. Wodon. 2018. Gains in Human Capital Wealth: What Growth Models Tell Us, in G.-M. Lange, Q. Wodon, and K. Carey (eds.), *The Changing Wealth of Nations 2018: Sustainability into the 21st Century*. Washington, DC: The World Bank.

Paul, S. 2016. Women's Labour Force Participation and Domestic Violence: Evidence from India. *Journal of South Asian Development* 11(2).

Reimo, A. M. Muñoz and A. Revenga. 2017. What Works for Women's Work. Mimeo. Washington, DC: The World Bank.

Rubiano M. E. and M. Viollaz. 2018. Gender Differences in Time Use: Allocating Time between the Market and the Household. Mimeo. Washington, DC: The World Bank.

Savadogo, A. and Q. Wodon. 2018. Impact of Child Marriage on Women's Earnings across Multiple Countries. Education Global Practice. Washington, DC: The World Bank.

Tavares, P., and Q. Wodon. 2018. Global and Regional Trends in Women's Legal Protection against Domestic Violence and Sexual Harassment. *Ending Violence against Women Notes Series.* Washington, DC: The World Bank.

Van de Walle, D., M. Ravallion, V. Mendiratta, and G. Koolwal. Long-term Impacts of Household Electrification in Rural India. World Bank Policy Research WP 6527. Washington, DC: The World Bank.

Winkler, A. 2016. Women's Labor Force Participation. Family-friendly Policies Increase Women's Labor Force Participation, Benefiting Them, Their Families, and Society at Large. IZA World of Labor Paper 289.

Wodon, Q. 2017. Estimating the Economic Impacts and Costs of Child Marriage Globally: Methodology and Estimates. Education Global Practice. Washington, DC: The World Bank.

Wodon, Q. 2018. What Is the Cost of Gender Inequality in Lost Earnings? Global Estimates Based on the Changing Wealth of Nations. Mimeo. Washington, DC: The World Bank.

World Bank. 2003. Implementation Completion Report on a Loan in the Amount of US$ 10 Million Equivalent to The Kingdom of Morocco for a Rural Water Supply and Sanitation Project, Report No: 25917.

World Bank. 2006. *Where Is the Wealth of Nations? Measuring Capital for the 21st Century*, Washington, DC: The World Bank.

World Bank. 2010. *Stepping Up Skills for More Jobs and Higher Productivity*. Washington, DC: The World Bank.

World Bank. 2011. *The Changing Wealth of Nations? Measuring Sustainable Development in the New Millennium*, Washington, DC: The World Bank.

World Bank. 2012. *World Development Report 2012: Gender Equality and Development*. Washington, DC: The World Bank.

World Bank. 2017. *World Development Report 2017: Learning to Realize Education's Promise*. Washington, DC: The World Bank.

World Bank and One. 2014. *Leveling the Field: Improving Opportunities for Women Farmers in Africa*. Washington, DC: The World Bank and One.

World Economic Forum. 2017. *The Global Gender Gap Report 2017*. Geneva: The World Economic Forum.

THE COST OF GENDER INEQUALITY:

UNREALIZED POTENTIAL: THE HIGH COST OF GENDER INEQUALITY IN EARNINGS

———