

Gender Gaps in Education: The Long View

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Abstract

Many countries remain far from achieving gender equality in the classroom. Using data from 126 countries between 1960 and 2010, we document four facts. First, women are more educated today than fifty years ago in every country in the world. Second, they remain less educated than men in the vast majority of countries. Third, in many countries with low levels of education for both men and women in 1960, gender gaps widened as more boys went to school, then narrowed as girls enrolled; thus, gender gaps got worse before they got better. Fourth, gender gaps rarely persist in countries where boys are attaining high levels of education. Most countries with large, current gender gaps have low levels of male educational attainment. Many also perform poorly on other measures of development such as life expectancy and GDP per capita. Improving girls' education is an important goal in its own right, but closing gender gaps in education will not be sufficient to close critical gaps in adult life outcomes.

[†] The order of author names was randomly assigned using the American Economic Association's author randomization tool.

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The principal data set set used in this paper is available here:
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Investing in girls' education has long been held up as an antidote to the manifold challenges of the developing world. Researchers, politicians, and celebrities have all championed the value — both inherent and instrumental — of girls' education. For example, a review of evidence from fifteen years ago concluded that “extensive research confirms that investing in girls' education delivers high returns not only for female educational attainment, but also for maternal and children's health, more sustainable families, women's empowerment, democracy, income growth, and productivity” (Herz and Sperling, 2004). Former World Bank president Jim Yong Kim said that “investing in gender equality and girls' education isn't just the right thing to do; economically, it's one of the smartest things to do” (World Bank, 2018a). Politician Hillary Clinton, in her capacity as first lady of the United States, said that “if women are healthy and educated, their families will flourish” (Minerva, 2012). Dozens of celebrities signed an open letter to world leaders that says, “Every additional year of school that a girl completes increases her future earnings, which is good for her family, her community and her country” (Urban, 2017).

Despite these promised gains, adult women still have less education than men in more than two-thirds of the world's countries.¹ In this paper, we examine fifty years of data from 126 countries to identify key trends in girls' education. We document four facts. First, women are more educated today than at any point in history. In every country in the world, women have more education today than they did fifty years ago. Second, despite increases in female schooling, women are still not as educated as men. In 2010, women's educational attainment lagged behind men's in 90 of 126 countries in our sample, and the gap in attainment was greater than a year in 30 countries. In contrast, there were only 5 countries in our sample where adult women had one year more of education than adult men in 2010. Third, gender gaps often get worse before they get better. In countries that had low overall rates of educational attainment in 1960, the gender gap often worsened over the subsequent decades before narrowing. Fourth, gender gaps rarely persist in educated countries. Countries where gender gaps are large tend to be the same countries where boys

are also getting a low level of education. A disproportionate number of these countries also perform poorly on other measures of development — for example, life expectancy, GDP per capita, and measures of state capacity. As countries progress and achieve high levels of education for their boys, girls also tend to attain access.

This study complements earlier work documenting advances in girls’ education around the world. Most recently, [Psaki et al. \(2018\)](#) identify low- and middle-income countries where girls’ education is advancing. Our data covers a much broader range of countries and years and complements their work, which uses individual-level micro data for a smaller set of countries. [Bertocchi and Bozzano \(2019\)](#) examine the gender gap in education for an earlier time period (1850-1950), also for a smaller group of countries. Our study also complements two other literatures, one on the impacts of girls’ education on outcomes for girls and others ([Mensch et al., 2019](#); [Psaki et al., 2019](#); [Qureshi, 2017](#)), and another on what interventions are most effective at improving girls’ education ([Sperling and Winthrop, 2015](#); [Evans and Yuan, 2019](#)). In this paper, we focus on years of schooling, which is associated with a range of positive outcomes ([Oye et al., 2016](#)). However, that does not downplay the importance of quality in education ([World Bank, 2018b](#); [Pritchett, 2013](#)).

The rest of the paper is structured as follows. In Section 1, we discuss the principal data source for this study and our sample. In Section 2, we document four broad facts about girls’ education. In Section 3, we characterize the set of countries that are not on track to eliminate gender gaps in educational attainment in the foreseeable future. In Section 4, we discuss the limitations of girls’ education as a tool of economic empowerment. Section 5 concludes with a discussion of key future research to advance our understanding of the role and future of girls’ education.

1 Data

The principal source of data for this analysis is the Barro-Lee Educational Attainment Dataset (Barro and Lee, 2013). It provides a measure of educational attainment of the adult population (15 years and over). Coverage is at 5-year intervals from 1950 to 2010 for 146 countries, disaggregated by age and gender. No other source of data on educational attainment documents (recent) historical trends for such a large number of countries. The underlying data come from available census and survey data provided by national statistical agencies, UNESCO, Eurostat, and other sources.²

We use a sample of 126 countries, excluding all (mostly high-income) countries that were founding members of the Organisation for Economic Co-operation and Development (OECD).³ We use data from 1960 to the most recent available year, 2010.⁴

We calculate the gender gap by subtracting average level of educational attainment among men from the average level of educational attainment among women. Hence, a negative number indicates that men are more educated than women and vice versa. We use the difference in education levels rather than the ratio of male years of schooling to female years of schooling because doing so is less likely to suggest that gender gaps are declining when they may not be: a fixed difference in the levels of educational attainment will suggest a declining gender gap as the level of male educational attainment increases, whereas a fixed ratio of education levels will suggest an increasing gender gap as the level of male attainment increases. The broad historical trend is of declining gender gaps, so our approach is conservative. Furthermore, we use the average of the adult population, which is slower to change than if we were to focus only on a single age cohort. For that reason, countries where current cohorts achieve many years of education may still have a relatively low average overall if previous cohorts had little education.

2 Four Facts About Gender Gaps in Education

Fact 1: Women are more educated today than at any point in history

In 1960, adult women across the 126 countries in our sample had an average of 2.6 years of education. By 2010, that number had nearly tripled to 7.7 years of education. Women have more education today in every single country in our sample. Education for men has also increased, from 3.5 years of schooling in 1960 to 8.2 years in 2010. Figure 1 shows the trajectory of male and female educational attainment in each of the 126 countries in our sample. The country with the largest gain in female schooling, the United Arab Emirates, began at the low level of 0.9 years of schooling for the average woman and shot to 10 years by 2010, but even the country with the smallest gain in adult female schooling over the 50 years, Senegal, shows a marked improvement for women.⁵ In every country, women have more education now than ever before.

In most countries, increases in women's education have been accompanied by increases in men's education. Figure 1 illustrates this: most of the country-level trajectories are concentrated around the 45-degree line, suggesting similar gains for both sexes. There are, of course, outliers. Women's relative gain (as compared to men's) was worst in Afghanistan, where women's educational attainment increased by only 0.4 years for every year increase in men's attainment.⁶ In Yemen and the Central African Republic, women's schooling increased by less than 0.6 years for every year increase in men's schooling. However, these countries are exceptions. Women's educational attainment increased by more than a year for every year of increase in male attainment in 94 of 126 countries.

The pattern of marked gains for women over the last 50 years is remarkably consistent around the world. In most regions, even the countries with the smallest gains in women's education have shown sizable improvements. For example, the smallest gain in Latin America and the Caribbean was in Haiti, where women's education increased more than six-fold, from a little more than half a year to more than three years. In Yemen, the country with the

smallest gain in the Middle East and North Africa, women’s education increased from an average of virtually no education in 1960 to more than two years in 2010. New Zealand, the country with the smallest gains in East Asia and the Pacific, made smaller absolute gains (1.6 years), but average women’s education was already very high in 1960, at 9.8 years.

In each region, there are countries where women’s educational attainment has improved dramatically. In Malaysia, adult women’s education jumped from 1.5 years in 1960 to more than 10.2 years in 2010. In Botswana, women’s education leapt from 1.5 years to 9.4 years, a sixfold increase. As Figure 1 illustrates, there are standout countries in every region, but almost all countries in our sample saw substantial improvements. Women’s educational attainment more than doubled in 107 of 126 countries (85 percent); it increased by more than five years in 70 countries (or 56 percent of our sample).

The region with the largest average gain over the time period is the Middle East and North Africa, where women’s education has increased by more than six years.⁷ The Europe and Central Asia region had the highest level of female educational attainment in 1960 and still saw the second largest increase (from 5.1 years to 11.1 years). The two regions with the lowest levels of women’s education in 1960 — South Asia and Sub-Saharan Africa, with just over one year each — also had the smallest absolute gains in women’s education, with an increase of under four years each. Furthermore, those are the only two regions in which a year’s increase in men’s education over that time period was not accompanied by at least a year’s increase in women’s education. Even there, however, women’s education has more than quadrupled over the time period. Thus, across all countries and regions, women are more educated now than ever before.

Fact 2: Women are still not as educated as men

While women’s education increased dramatically around the world between 1960 and 2010, the gender gap in educational attainment persists in most countries. During that period, the gender gap narrowed in 94 countries but widened in 32. Across all countries in our sample,

the median gender gap improved from -0.8 in 1960 to -0.3 in 2010 (as shown in Figure 2) — so women in our sample countries had 0.8 fewer years of schooling than men in 1960, and they had 0.3 fewer years of schooling than men in 2010.

Some regions made very clear progress in reducing educational gender gaps between 1960 and 2010. In Europe and Central Asia, every single country experienced a shift in the gender gap in favor of women. In East Asia and the Pacific, all but two countries (Cambodia and Papua New Guinea) saw gender gaps diminish, and in Latin America and the Caribbean, all but three countries (Cuba, Guatemala, and Haiti) observed the same. Progress was more mixed in other regions. In the Middle East and North Africa — the region that experienced the largest increase in educational attainment among women — gender gaps in attainment grew in 7 of 17 countries. In both South Asia and Sub-Saharan Africa, the median actually worsened. The country with the largest average gap in 2010 — Afghanistan — went from -0.5 in 1960 to -3.4 in 2010.

In every region of the world, women are still more likely to have no schooling than men. Table 1 shows the ratio of women at each level of education relative to men in 2010. Across our entire sample, there are 1.73 women who have no schooling for every man. Even in Latin America and the Caribbean, where women are slightly more likely than men to have completed at least some secondary education (1.02 women for every man), women are also more likely to have no schooling at all (1.48 women for every man). In the regions with the largest gaps, South Asia and Sub-Saharan Africa, for every man who has completed at least some primary schooling, 0.73 and 0.86 women have, respectively.

As shown in Appendix Table A4, this pattern is still apparent when we restrict attention to the younger age cohorts. Among adults aged 25–29, women were more likely than men to have no schooling in every region of the world except Europe and Central Asia. Women aged 25–29 are substantially less likely to have completed primary school than similarly aged men in South Asia and substantially less likely to have completed secondary school than similarly aged men in Sub-Saharan Africa, though other regions are now quite close to parity on both

margins.⁸

Fact 3: Gender gaps often got worse before they got better

While the global trend has been positive over the course of fifty years, gender gaps widened before beginning to narrow in many countries. As shown in Figure 3, this trend is most apparent in the Middle East and North Africa and in Sub-Saharan Africa. In the Middle East and North Africa region, the gap deteriorated from -1.1 years in 1960 to -1.4 years in 1985 before rising to -0.4 years in 2010. In Sub-Saharan Africa, the gap deteriorated from -0.72 years in 1960 to -1.22 years in 1985 before beginning to improve, reaching -0.90 years by 2010.⁹ This pattern contrasts with the experience of regions that were, on average, more educated in 1960. In Europe and Central Asia, the gender gap was -1.05 years in 1960, and it decreased (in magnitude) steadily over the next 50 years, reaching -0.14 in 2010. Similarly, in East Asia and Pacific, the gap was -1.43 years in 1960, and improved steadily to -0.40 years in 2010. In Latin America and the Caribbean, women were 0.42 years behind men in terms of educational attainment in 1960; the gap increased only slightly — from -0.42 to -0.46 by 1985 — before improving, reaching -0.08 by 2010.

In total, the gender gap deteriorated before beginning to improve for 96 (76 percent) of the 126 countries in our sample (Appendix Figure A1).¹⁰ Of these 96 countries, the gender gap was larger in 2010 than in 1960 in 31 countries. In these countries, the largest gender gap occurred sometime between 1960 and 2010, but recent improvements have not fully eliminated the increases in the gap that occurred after 1960. In the remaining 65 of the 96 countries where things got worse before they got better, gender gaps were smaller in 2010 than they were in 1960, but they grew larger before beginning to shrink. In some cases, this “it gets worse before it gets better” trajectory is particularly marked. In Nicaragua, for example, the gap doubled between 1960 and 1975, from -1.1 to -2.5, before completely closing and shifting to favor girls by 2010. In Zambia, the gap nearly doubled from -1.2 to -2.3 between 1960 and 1985 before narrowing to -0.6 in 2010. In most of the countries where

the gap got worse before improving (72 percent), the nadir occurred at or before 1985.

Why is it so common for gender gaps to get worse before they get better? Most countries that experience this phenomenon had low levels of both men’s and women’s education in 1960. As educational opportunities begin to expand, those countries tended to invest first in education for men. [Eloundou-Enyegue et al. \(2009\)](#) observe, using household survey data from across Africa in the 1990s and early 2000s, that as countries’ total enrollment increased, so did the gender gap.

Across our sample countries, we observe that countries with lower rates of female and male schooling in 1960 are much more likely to experience a subsequent widening of the gender gap (Figure 4). Thirty of 43 countries where the average level of male educational attainment was less than two years in 1960 experienced worsening gender gaps in education over the next 50 years, compared to two of the 83 countries where the average level of male educational attainment was above two years in 1960. Thus, the countries where gender gaps have been worsening over time are precisely those countries where both men and women had very little education to begin with.

Fact 4: Gender gaps rarely persist in educated countries

There are very few countries where men are highly educated but women are not; once men become highly educated, women tend to become highly educated as well. Figure 5 illustrates this pattern by showing country-level transitions between 1960 and 2010. Countries where the average level of educational attainment among men is greater than eight years (in a given year) are classified as “high-education” countries, while those where the average gender gap is greater than one year are classified as “gender gap” countries. In 1960, just seven countries in our sample (Armenia, Australia, the Czech Republic, Israel, Japan, New Zealand, and Slovakia) had high levels of male educational attainment, and only two of those (Israel and Japan) had gender gaps. The other 119 countries had low levels of men’s education in 1960; 42 percent of those countries also had substantial gender gaps in educational attainment.¹¹

By 2010, the number of high-education countries had increased to 68. More than half the countries in the sample had high levels of education and small gender gaps by 2010, and almost half the countries that had low levels of male and female educational attainment in 1960 had high levels of (male) attainment and small gender gaps by 2010.¹² In countries that had low levels of male educational attainment in both 1960 and 2010, the gender gap widened in some countries and narrowed in others. As long as male educational attainment remains low, the direction of future changes in the gender gap remains unpredictable.

In contrast, the evolution of gender gaps in countries where men are highly educated is quite predictable: gender gaps (in educational attainment) tend to diminish over time.¹³ All seven countries that had high levels of male educational attainment in 1960 had high levels of attainment and small gender gaps in attainment in 2010. The two high-education countries that had substantial gender gaps in 1960 — Israel and Japan — no longer had meaningful gaps in 2010.¹⁴ However, five countries — Bolivia, Ghana, Iraq, South Korea, and Tunisia — emerged as countries with high levels of male education and meaningful gender gaps in educational attainment in 2010. Their trajectories illustrate the transitional nature of the situation in which high levels of male education and large gender gaps coexist.

In 1960, South Korea was a country with a relatively low level of male educational attainment and a large gender education gap: men had an average of 5.6 years of education, while women had an average of only 3.0 years. Over the next 50 years, educational attainment increased for both men and women, and the gender gap in attainment declined monotonically. However, there was still a gender gap of 1.3 years in 2010. If current trends continue, one would expect South Korea's attainment gap to be less than one year of schooling by 2025, and to disappear completely by 2098.

The other four high-education countries with large gender gaps in attainment are examples of the “it gets worse before it gets better” pattern. Figure 6 plots male and female educational attainment in these countries over time. All four had low levels of male educational attainment in 1960: from 3.7 years of schooling in Bolivia to only 0.8 years in Iraq.

Bolivia, Ghana, and Tunisia also had large gender gaps in 1960 (while Iraq could not have had a large gender gap because men had too little education for women to lag far behind). In 1960, women had, on average, less than one year of schooling in Iraq, Ghana, and Tunisia. Women had more education in Bolivia in 1960 — 2.3 years — but their educational attainment lagged behind that of men by more than a year. All four of these countries made remarkable progress over the subsequent 50 years: both men’s and women’s average educational attainment increased by more than five years. However, gender gaps in attainment increased throughout the 1960s and 1970s in all four countries, before beginning to decline sometime between 1980 and 1990. In Ghana, the gender gap reached 3.3 years by 1985 before beginning to come down. In Iraq, the gender gap declined between 1985 and 1995, increased in 2000, and has been declining since then. In all four countries, gender gaps in attainment are now declining — though there is considerable variation in the rate of decline. If current trends continue in Bolivia, Ghana, and Tunisia, gender gaps in attainment will disappear completely by 2051. Progress has been much slower in Iraq: if current trends continue there, the gender gap in attainment will not disappear until 2098.

These countries illustrate the common historical pattern: men’s educational attainment initially surges ahead, but women’s attainment tends to catch up in countries with high levels of men’s education. Figure 7 shows, for each five-year period, the number of countries with high levels of male educational attainment (greater than eight years of schooling, on average) and the share of those countries where there is a gender gap of more than a year. The number of high-education countries (for men) has increased steadily over time, from 7 in 1960 to 68 in 2010, as discussed above. The number of countries where men have greater than eight years of schooling and women’s educational attainment lags behind men’s by more than a year rises and falls over time — it peaked at 12 in 1990 and then dropped to five in 1995, but was back up to 10 in 2005 before falling again (to five) in 2010. However, the proportion of high-education countries with substantial gender gaps in attainment peaked at 62.5 percent in 1965 and has been declining fairly steadily since then; it has remained below

50 percent since 1985 and below 20 percent since 1995.

Countries do transition through periods with high levels of male educational attainment (an average of more than eight years) and gender gaps of more than one year: 28 countries were in this state at some point between 1960 and 2010 (Appendix Figure A2). But many of these countries — for example, China, Iran, Malaysia, and Peru — exist as highly educated countries with substantial gender gaps for very short periods before gender gaps begin to disappear. Gender gaps take longer to diminish in other countries — for example, Croatia and South Korea — but these countries appear to be the exception rather than the rule; moreover, even in these countries, gender gaps in educational attainment do become smaller eventually.

Where do the largest gaps remain? Table 2 shows the 30 countries with the gender gaps of more than one year (in educational attainment) in 2010. 19 of the 30 countries with the largest gender gaps in educational attainment fall in the bottom quartile in terms of male attainment.¹⁵ Most of these countries also perform poorly on other measures of human development: 16 are in the bottom quartile for life expectancy at birth, and 17 are in the bottom quartile for infant mortality. 14 are low-income countries, and 16 are in the bottom quartile of countries in our sample in terms of PPP-adjusted GDP per capita. Poverty headcount ratios in these countries range from 76.6 percent in the Democratic Republic of Congo to 0.2 percent in South Korea; 12 of the 30 countries are in the top quartile of poverty rates in our sample. 14 of the 30 countries were classified as “fragile situations” by the World Bank in 2019. Nine countries had ongoing peacekeeping or peace-building missions in 2019. 11 were classified as “not free” by Freedom House in 2018, and 14 are in the worst quartile in terms of Transparency International’s Corruption Perceptions Index.

Poor performance on other development outcomes does not justify a large gender gap in education, but it underscores the complex challenges hampering progress on girls’ education in many of the countries where gender gaps in attainment persist. Existing evidence suggests that interventions focused exclusively on girl’s education may not be the most effective or

efficient way to improve educational outcomes for girls (Evans and Yuan, 2019). This is particularly true in weak, fragile states that are struggling to address multiple developmental crises simultaneously. There are outliers: gender gaps in India, Morocco, South Korea, and Tunisia are larger than one would expect relative to performance on other measures of governance and development. However, in most cases, gender gaps in educational attainment are a symptom of a broader failure of growth, governance, and development — and thus they are unlikely to be eliminated by policies focused exclusively on girls’ education.

3 What Does the Future Hold?

By 2010, women had more education than men in 36 of the 126 countries in our data set, and many more countries are well on their way to eliminating gender gaps in educational attainment. Table 3 presents linear projections of current trends (1985-2010) for countries that (i) had gender gaps favoring men in 2010 and (ii) saw those gender gaps shrink between 1985 and 2010.¹⁶ In 2010, 60 countries had relatively small gender gaps (less than a year difference in average attainment) favoring men. In 55 of those countries, the gender gap got smaller between 1985 and 2010. If these countries continue on their current trajectories, 45 countries will completely eliminate the gender gap in educational attainment by 2050. An additional five — Burundi, Cyprus, Malawi, Taiwan, and Vietnam — will eliminate the gender gap in attainment by 2100 if current trends continue. A few countries with relatively large gaps in attainment are also on track to eliminate them by 2050: Ghana and Tunisia will eliminate the gender gap in attainment in 2042 if current trends continue, while South Korea will eliminate its gender gap in attainment in 2046.¹⁷ Eight other countries with large gender gaps could eliminate them by 2100.

Linear projections help identify those countries that are not on track to eliminate substantial gender gaps in educational attainment in the foreseeable future, but they are not predictions. Countries often change their trajectories, as evidenced by our earlier finding that

many countries experienced a widening of the gender gap followed by a narrowing. When the projected year of closing the gap is in the distant future, it is an indicator that countries have made little to no progress in recent years. Extrapolating the 1985–2010 trend suggests that Paraguay, Colombia, and the Maldives could eliminate their gender gaps between 2100 and 2200. Mozambique and Peru would not eliminate their gender gap until between 2350 and 2400. In Botswana, Chile, China, El Salvador, and Singapore, gender gaps in attainment were less than a year in 2010, but they have been widening over time. Gender gaps also increased between 1985 and 2010 in 14 of the 30 countries with relatively large gender gaps favoring men (where men have more than a year more schooling than women, on average).

In some countries, gaps widened between 1985 and 2010 (or narrowed very slightly), but recent trends suggest more optimism. In Liberia, for example, the gender gap widened between 1960 and 2000: male educational attainment rose from 1.1 years in 1960 to 5.0 years in 2000, while female educational attainment only rose from 0.3 years to 2.1 years. Since 2000, however, male attainment has continued to rise while the gender gap has begun to diminish. The pattern is similar in Benin, where the gender gap went from -0.6 years in 1960 (when both men and women had, on average, less than a year of schooling) to -2.4 years in 2000, but has declined slightly (to -2.1 years) since. These countries, and several others, may be examples of the “it gets worse before it gets better” pattern — if recent trends are sustained.¹⁸

Another approach to see what the future holds is to look at younger cohorts of women and men rather than the entire adult population. We re-examine our main findings, focused only on the cohort aged 20-24, as this cohort will have completed their education in much of the world. Education has still risen for women in almost every country in the world (Figure A4), but the median gap has actually risen above zero around the developing world (Figure A5). In other words, for those cohorts of women and men just entering the labor market, women have more education than men in more than half the countries in our sample. That trend is driven by countries in Europe and Central Asia, Latin America and the Caribbean,

East Asia and the Pacific, and the Middle East and North Africa (Figure A6).¹⁹ In South Asia and Sub-Saharan Africa, the gaps continue to favor men. Finally, the pattern that gender inequality fades in countries with high levels of education for men manifests more strongly in the younger cohort (Figure A7). Only 3 out of 86 countries (3.5 percent) with high levels of education for men have a gender gap larger than a year, whereas 14 out of 40 countries (35 percent) with lower levels of education for men have large gender gaps.

Around the world, women are getting more education than ever before — but they aren't always catching up with men. In most countries, women's attainment lags behind men for a time before eventually catching up (or almost catching up). In some places, gender gaps were still widening in 2010. These are usually countries where educational attainment among men remains low, and limited schooling for both men and women is only one of many manifestations of poverty, insecurity, and weak governance.

4 Girls' Education and Women's Equality

Education is a human right and has been recognized as such by the international community since the Universal Declaration of Human Rights in 1948 (United Nations, 1948). Educating girls yields a range of benefits — for the girls themselves, for their dependents, and for society as a whole.²⁰ Yet, education is not a silver bullet leading to women's empowerment and gender equality: education is an end in itself, but there is little evidence that achieving gender equality in education will lead to gender equality in other domains.²¹

Figure 8 shows the relationship between the country-level change in the gender gap in educational attainment between 1990 and 2010 and the change in the gender gap in labor force participation over the same period.²² There is no systematic relationship between the two. Gender gaps in education have fallen some, and gender gaps in labor force participation have declined substantially over the same period, but there is no evidence that one predicts the other. This empirical pattern is consistent with existing evidence from both

reviews (Klasen, 2019) and studies from individual countries. Cameron et al. (2001) find an inconsistent relationship between education and labor market participation across five Asian countries. In China, more educational attainment among women did lead to more labor force participation, but the same pattern did not hold in India (Azam and Han, 2019). In fact, there is some evidence that female labor force participation declined as education levels increased in India, perhaps because husbands' rising incomes allowed wealthier women to abstain from the labor market (Bhargava, 2018).

Around the world, 129 million school-aged girls are not enrolled in school. Girls of primary school age are 1.2 times more likely to be out of school than boys (UIS, 2018). Gender gaps in education are both a symptom and a cause of gender inequality. Households that cannot afford to educate all of their children often favor boys, but families (or societies) where boys get as much education as they desire while women and girls remain uneducated are rare. More often than not, gender gaps in educational attainment persist in countries that are struggling to progress on many fronts — in educating boys and girls, in other dimensions of human development, and in political and economic domains as well. Gender gaps in educational attainment tend to disappear as countries grow, but this does not mean that educational parity leads to gender equality.²³

5 Conclusion

With data on women's and men's education across 126 countries and 50 years, we identify four broad facts about education. First, women's education has increased in every country in the world. Second, in the vast majority of countries, it still lags behind that of men. Third, in many countries the gap between women's and men's education widens before it narrows. Fourth, it is rare that large gender gaps in education persist in countries where men achieve high levels of education. We further observe that equalizing education will be insufficient to equalize economic opportunities for men and women.

Because gender gaps rarely persist in countries with high levels of educational attainment, policies that expand education for all children may also help to close the gender gap. Indonesia embarked on a massive school-building exercise in the 1970s which yielded long-term benefits in education and other life outcomes for both women and men (Duflo, 2001; Akresh et al., 2018; Mazumder et al., 2019). In Ghana, reducing the cost of secondary school increased educational attainment and other outcomes for women and men (Duflo et al., 2019). Eliminating school fees led to reductions in early fertility in Nigeria and Kenya (Osili and Long, 2008; Brudevold-Newman, 2019), though eliminating school fees can sometimes exacerbate gender gaps (Lucas and Mbiti, 2012). A review of interventions to improve access and learning found that general interventions — not targeted by gender — were often among the most effective at boosting girls’ education (Evans and Yuan, 2019). In countries with persistent gender gaps despite high levels of male education — for example, South Korea — more targeted programs may be needed; however, our analysis suggests that these countries are the exception and not the rule. Even in settings where gender gaps in attainment are closing over time, policy makers may choose to prioritize rapid elimination of gender gaps over expanding access to education more broadly.

Many questions remain for future research. One question is what constrains girls’ participation in school in settings where gender gaps in attainment remain large, and which strategies are most appropriate to address these constraints. Many countries with large gender gaps in educational attainment are also struggling to recover from conflict, build state capacity, strengthen democratic institutions, and provide security and social protection to all citizens. In these settings, it is unclear whether the main obstacles to girls’ education are legal, political, economic, or social. When obstacles are legal or political, advocacy is likely to play a key role in pressuring governments to level the playing field. When the primary issue is the cost of schooling, policies that are gender-sensitive but not gender-targeted may be more critical — for example, aid to governments, reductions in school fees, and social protection programs that relax household budget constraints (Evans and Yuan, 2019). When

cultural and social issues constrain girls' education, grassroots advocacy is likely to play a key role in changing attitudes — but donors and other external actors may be limited in their ability to drive change from outside.

Our results resonate with previous work demonstrating that gender gaps often get larger before they begin to shrink (Eloundou-Enyegue et al., 2009), but we still know relatively little about when and why countries begin to shift from a widening attainment gap to a narrowing one. We show that countries that first experienced a widening are those that began with low levels of education for both men and women. But why the gap begins to narrow when it does and whether there are policy actions that can precipitate that shift are important, unanswered questions.

A final question is how we get from gender equality in education to gender equality in life outcomes. The United States achieved gender parity in educational attainment by 1870, fifty years before women's right to vote was enshrined in the constitution and almost one hundred years before the Civil Rights Act made workplace sex discrimination illegal. There are still legal obstacles — for example, a lack of laws prohibiting the expulsion of pregnant girls, child marriage laws, and inadequate protection against labor market discrimination — in many countries where gender gaps in attainment persist. Nevertheless, the experience of high-income countries shows that education alone is insufficient to close the earnings gap between men and women. In many countries, the more challenging task of changing social and cultural norms remains (Colclough et al., 2000) — and we have limited evidence on what factors drive increased support for gender equality beyond the classroom.

While we present evidence that increasing levels of education alone will not be enough to achieve economic equality by gender, not enough is known about the complementarities between educational investments and other reforms. For example, Hallward-Driemeier et al. (2014) examine the impact of reforms of property rights and legal capacity of women across 100 countries over 50 years and observe positive associations with both educational enrollment and a range of economic outcomes. Legal reforms may not only increase educational

enrollment but also increase the return on educational gains. Other reforms — such as those that encourage entrepreneurship — may increase the return on education for women. Beyond reforms, urban areas often have smaller gender gaps (Evans, 2019) and one reason for that may be higher returns to education in areas with more formal sector employment. If so, then ongoing urbanization in many countries may affect investments in women’s education.

In this study, we focus on educational attainment. But even where dramatic gains in attainment have been achieved, the quality of education often lags, with startlingly low learning outcomes in many low- and middle-income countries (World Bank, 2018b). Even low-quality schooling confers gains (Oye et al., 2016), but an analysis of schooling and literacy across 54 countries suggests that the gains from schooling in terms of child survival, fertility, and female empowerment are higher when schooling results in increased literacy (Kaffenberger et al., 2018). Even as the world seeks to close the remaining gaps in girls’ access to education, it will have to consider how to ensure that education is worth girls’ time.

Notes

¹The pattern is similar if we exclude high-income countries. Adult women have less education than adult men in 72 of 93 low- and middle-income countries for which data is available.

²In Appendix Table A1, we compare the countries included in the Barro-Lee dataset to the full sample of 193 UN member states. Countries in the Barro-Lee dataset have comparable income levels and adult literacy rates relative to the excluded countries.

³The excluded countries are Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. We use this criterion rather than country income status since the latter changes over time.

⁴A large number of countries in the sample became independent in the 1960s.

⁵Between 1960 and 2010, the average level of educational attainment among Senegalese women rose from 1.2 years to 2.2 years. The average level of educational attainment among Senegalese men rose from 3.1 years to 3.6 years.

⁶Between 1960 and 2010, women’s educational attainment in Afghanistan increased from 0.1 years to 2.0 years, while men’s attainment increased from 0.6 years to 5.4 years.

⁷Appendix Table 1 summarizes the gains by region.

⁸Interestingly, in the younger age cohorts of adults, we see evidence that women in Europe and Central Asia and, to a lesser extent, Latin America and the Caribbean are more likely than men to have completed secondary education.

⁹In South Asia, the gap has been widening since 1960, so the “getting better” part remains

in the future. Current data on school enrollment suggests that things may be getting better in parts of South Asia. In 2013, the most recent year for which data are available, the net primary enrollment rate in India was 93.0 percent for girls and 91.6 percent for boys (UIS, 2018).

¹⁰Appendix Table A5 shows the year of the largest gender gap for all 96 countries.

¹¹15 countries did not have a gender gap because both men and women had, on average, less than one year of education — making a gender gap defined in terms of a difference of at least one year of schooling impossible.

¹²29 of 51 countries (57 percent) that had low educational attainment and substantial gender gaps in 1960 had transitioned to high educational attainment without meaningful gender gaps; and 27 of 68 countries (40 percent) that had low educational attainment without substantial gender gaps in 1960 had transitioned to having high attainment and small gender gaps.

¹³Psaki et al. (2018) document the converse, in a smaller sample of 43 countries, that "both males and females were worst off in countries with female disadvantages."

¹⁴In 2010, the average level of educational attainment in Japan was 11.7 years for men and 11.5 years for women. The average level of educational attainment in Israel was 11.3 years for both men and women.

¹⁵Appendix Figure A3 shows that gender gaps are largest where male educational attainment is the lowest, and they are quite small in the overwhelming majority of highly educated countries. Appendix Table A3 shows that the pattern holds across regions. South Korea and India appear to be exceptions, but the gap has halved in South Korea as men's education has doubled.

¹⁶Five countries in our sample — Gabon, the United Arab Emirates, Qatar, Lesotho, and

Libya — have attainment gaps of more than one year that favor women. The gap favoring women has been getting larger over time in all except Gabon. This suggests that gender equality that advantages women may become a policy issue in a small number of countries in the future. In the original OECD countries, excluded from our sample, women's educational attainment exceeds men's in only 6 of 20 countries, and the median gap favoring girls in those 6 is only 0.26.

¹⁷Linear projections of the trends observed between 1985 and 2010 also suggest that the Republic of Congo and Syria could eliminate their gender gaps by 2050 if current trends continued. In Syria, this seems quite unlikely, and the data suggest that gender gaps have been widening since 2000 (after declining rapidly between 1985 and 2000). The Republic of Congo reduced its gender gap substantially between 1985 and 1995, but progress stalled after that and the gender gap actually widened between 2000 and 2005. Caution is warranted with all linear projections, but this is particularly true when past data are not consistent with a linear trend.

¹⁸In a small number of countries — for example, Peru — progress toward the elimination of gender gaps in attainment seems to have stalled.

¹⁹For a test of various hypotheses to explain the reversal in the gender gap, see [Bossavie and Kanninen \(2018\)](#).

²⁰Education (for both boys and girls) increases the human capital embodied in the workforce, increasing economic growth ([Hanushek and Woessmann, 2012](#)). Education also yields benefits beyond the economic. More educated women experience reduced child mortality ([Mensch et al., 2019](#)). They have lower fertility and better sexual health ([Psaki et al., 2019](#)).

²¹[Duflo \(2012\)](#) defines women's empowerment as "improving the ability of women to access the constituents of development – in particular health, education, earning opportunities, rights, and political participation."

²²Labor force participation data is from the World Bank's World Development Indicators from 1990 to the present.

²³While education as currently provided does not translate into gender equality in adulthood, some scholars propose that reforms to education systems could boost women's empowerment by building critical thinking skills as well as productive, personal, and social competencies that will pay off later in life (Ashraf et al., 2020; Buvinić and O'Donnell, 2019; Murphy-Grahan and Lloyd, 2016).

6 References

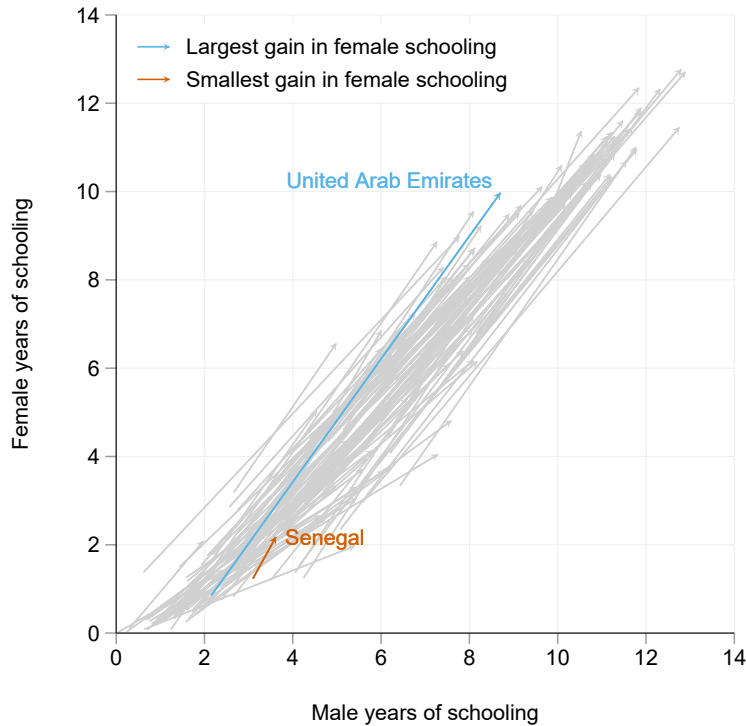
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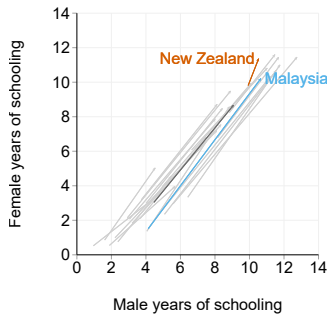
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Figure 1: Change in Average Schooling Years between 1960 and 2010

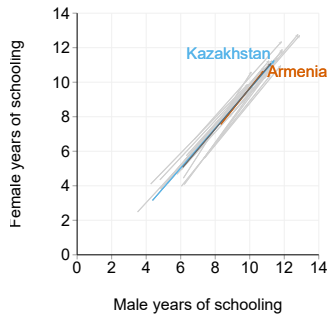


Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. Female years of schooling is the average educational attainment among adult women aged 15 and over; male years of schooling is the average educational attainment among adult men aged 15 and over. For each country, the arrow connects the average level of educational attainment in 1960 to the average level of attainment in 2010. Countries are assigned to regions based on the World Bank's classifications.

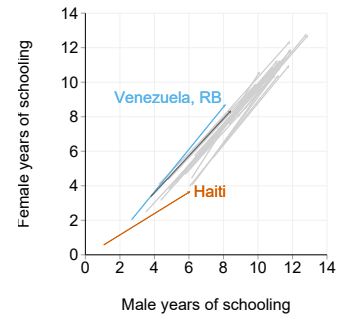
East Asia & Pacific



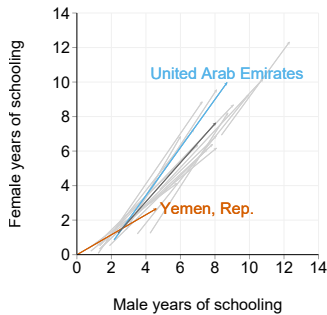
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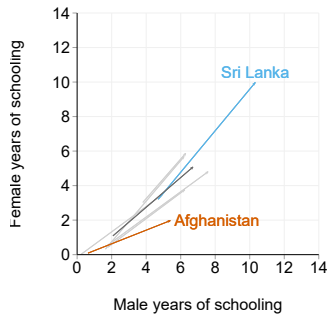
Latin America & Caribbean



Middle East & North Africa



South Asia



Sub-Saharan Africa

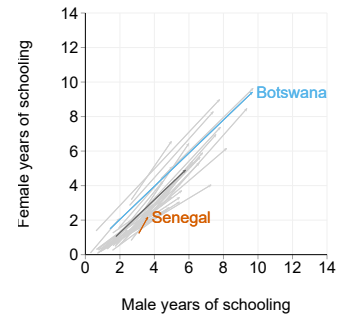
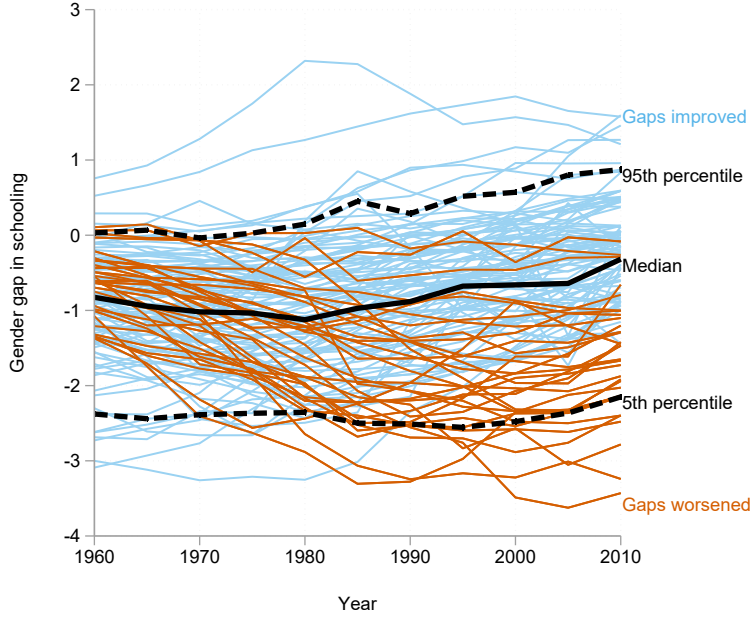
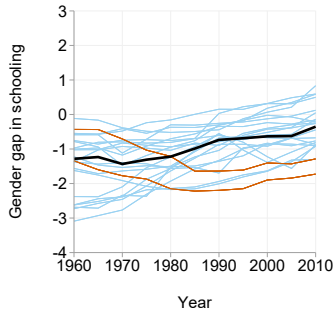


Figure 2: Change in Gender Gaps in Educational Attainment

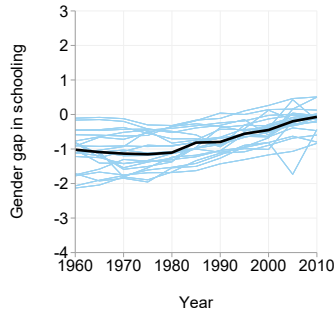


Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. The gender gap is the difference between average educational attainment (years of schooling) among adult women and average educational attainment among adult men. Orange indicates countries where women’s educational attainment grew more slowly than men’s between 1960 and 2010; light blue indicates countries where women’s educational attainment grew faster than men’s. Countries are assigned to regions based on the World Bank’s classifications.

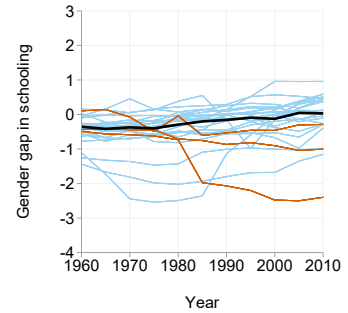
East Asia & Pacific



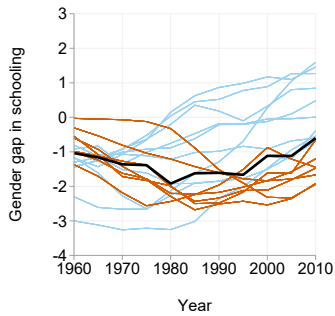
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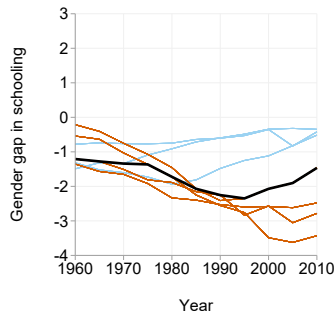
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Middle East & North Africa



South Asia



Sub-Saharan Africa

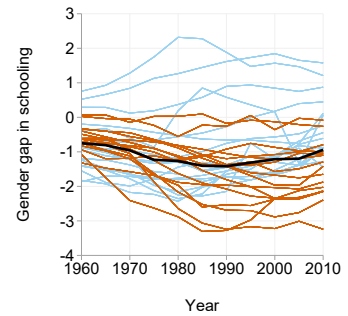
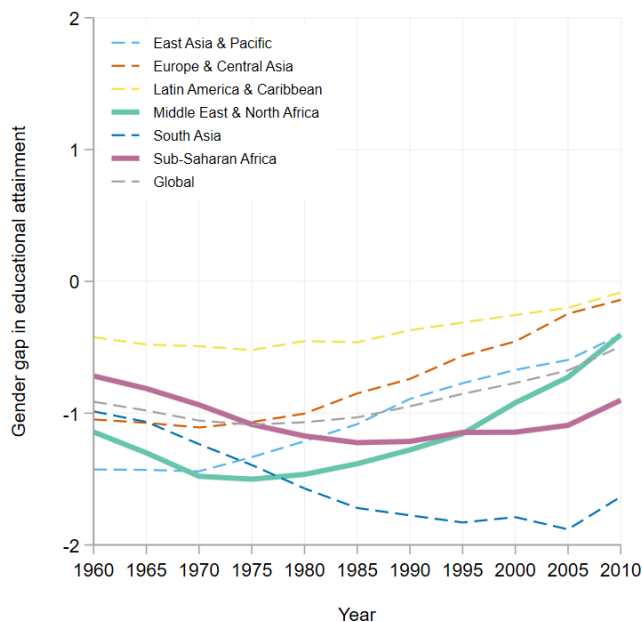


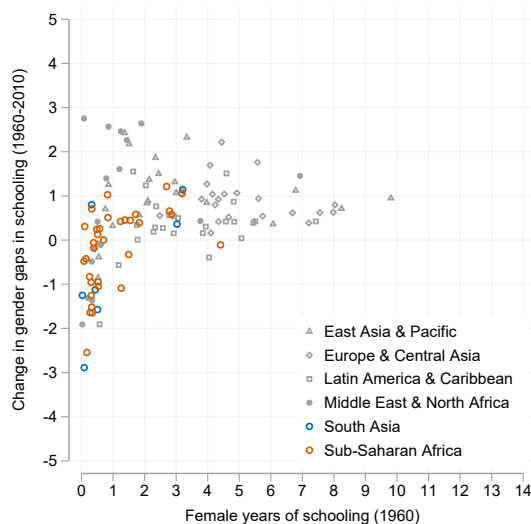
Figure 3: Regional Change in Gender Gaps in Average Schooling Years, 1960-2010



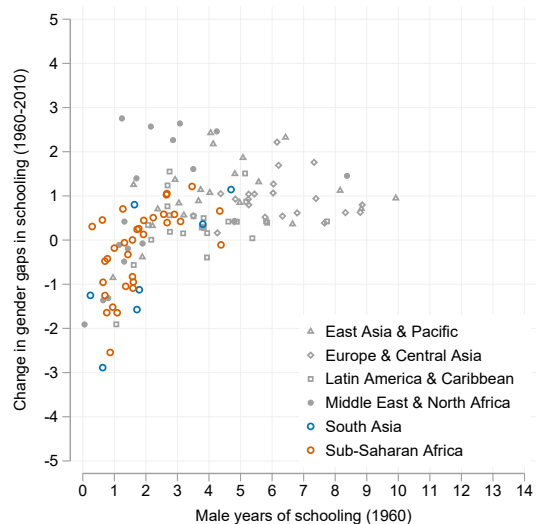
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD.

Figure 4: Change in Gender Gap in Average Schooling Years Given Schooling Levels in 1960

Female Schooling

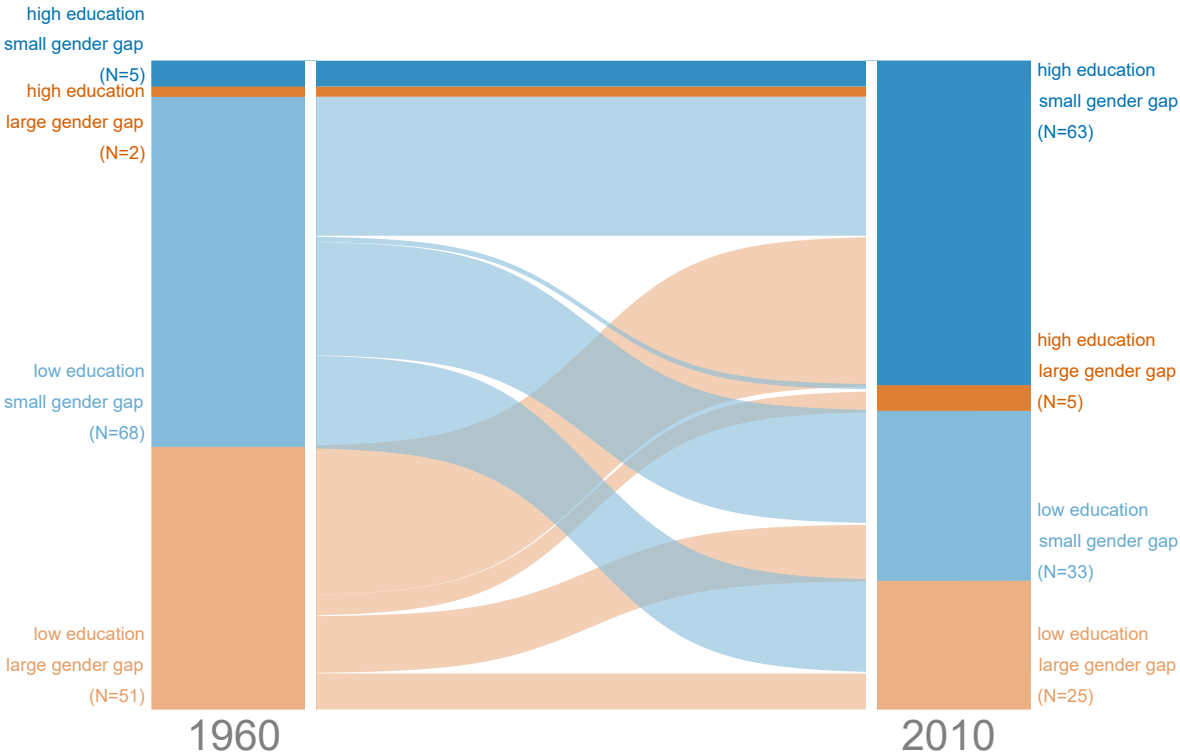


Male Schooling



Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD.

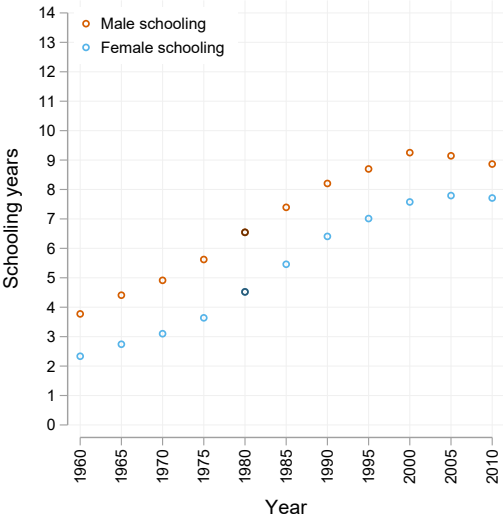
Figure 5: Gender Gaps across Countries with High and Low Levels of Male Education



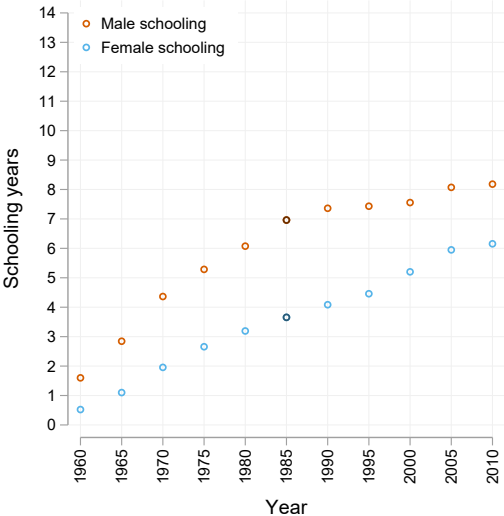
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. “High education” indicates countries where men have an average of more than eight years of education. “Large gender gap” indicates a difference in male vs. female educational attainment (mean years of schooling) that is greater than one year.

Figure 6: Male and Female Educational Attainment in Four Countries

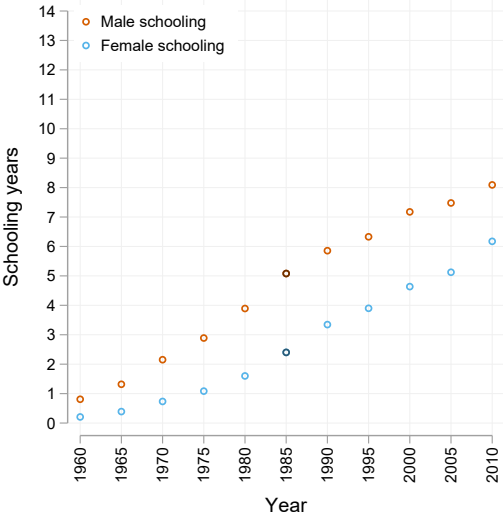
Bolivia



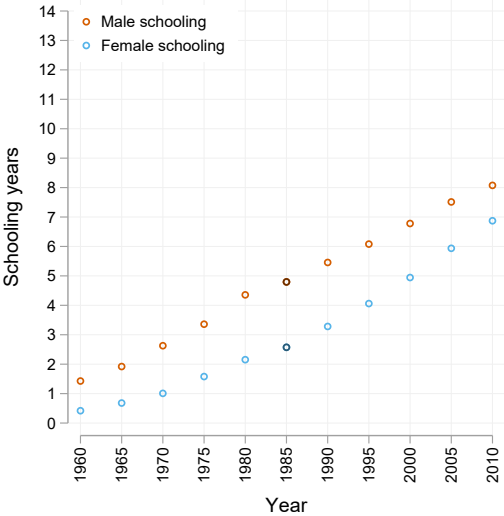
Ghana



Iraq

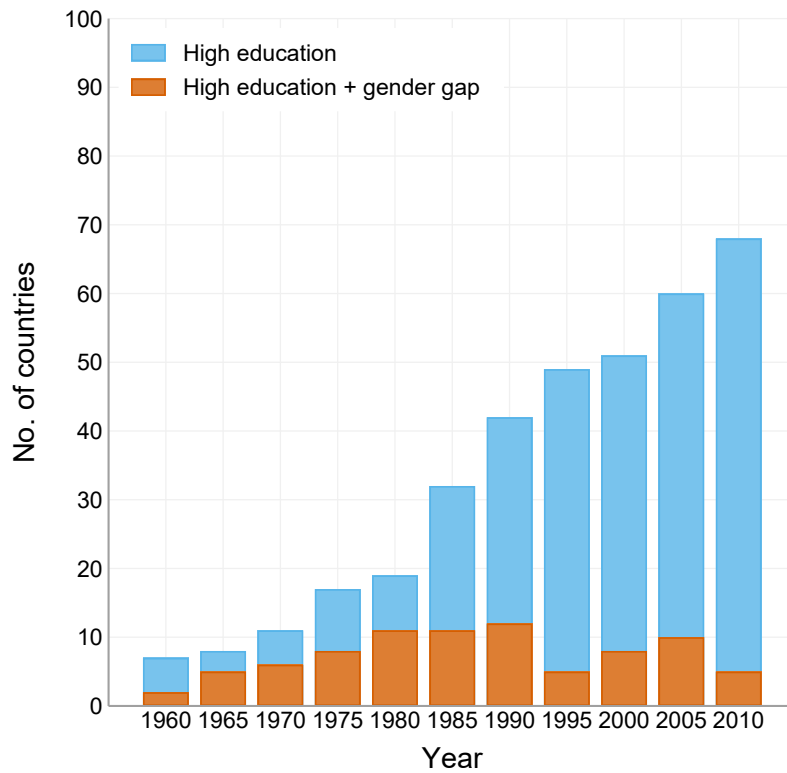


Tunisia



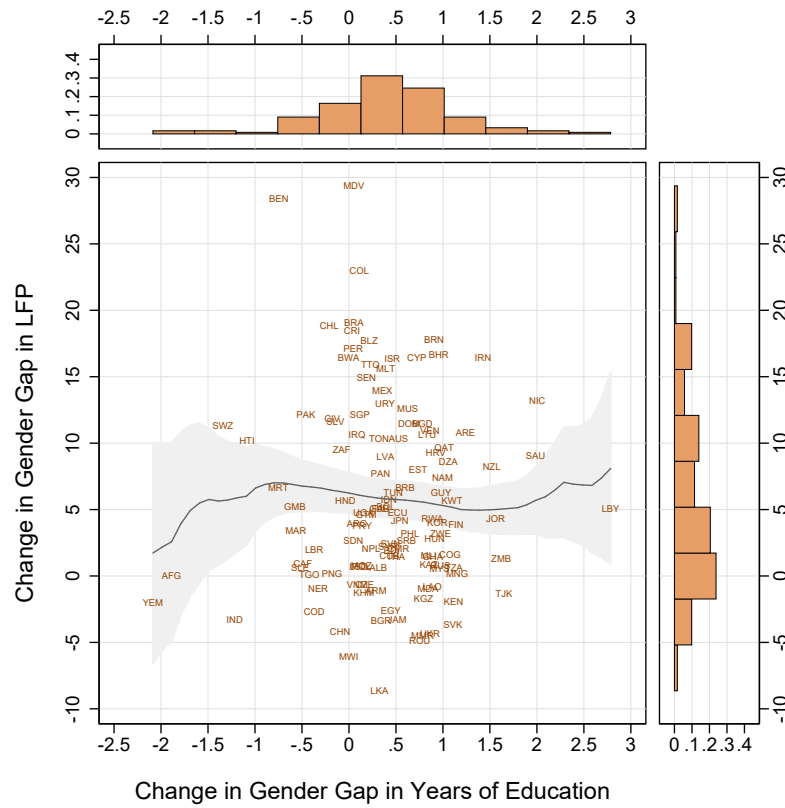
Notes. Data come from the Barro-Lee Educational Attainment Dataset. Figures show average educational attainment (years of schooling) for adult men and women. Darker circles indicate year of largest gender gap.

Figure 7: The Number of High-Education Countries by Year



Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. “High education” indicates countries where men have an average of more than eight years of education. “Gender gap” indicates a difference in male vs. female educational attainment (mean years of schooling) that is greater than one year.

Figure 8: Gender Gaps in Education and Labor Force Participation



Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. Data on labor force participation comes from the World Development Indicators database. Gender gaps are calculated in the difference in levels between female and male labor force participation and educational attainment. The change is the difference between the gender gap in 2010 and the gender gap in 1990. Positive changes indicate that the gender gap shrunk over time.

Table 1: Ratio of Males to Females at Various Education Levels in 2010

REGION	RATIO OF MALES TO FEMALES		
	NO FORMAL EDUCATION	COMPLETE PRIMARY	COMPLETE SECONDARY
East Asia & Pacific	1.89	0.99	0.93
Europe & Central Asia	2.13	0.99	0.94
Latin America & Caribbean	1.48	0.97	1.02
Middle East & North Africa	1.79	0.91	1.08
South Asia	1.84	0.73	0.88
Sub-Saharan Africa	1.52	0.86	0.77

Notes. NO FORMAL EDUCATION denotes the ratio of percent of female population with no schooling divided by percent of male population with no schooling. COMPLETE PRIMARY denotes the female-male ratio of percent of population that completed at least primary education. COMPLETE SECONDARY is defined analogously. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.

Table 2: Countries with Large Gender Gaps in Attainment in 2010

	2010 GAP	MALE ED.	BOTTOM QUARTILE			FRAGILE
			LIFE EXP.	PC GDP	CPI	
Afghanistan	-3.43	5.40	✓	✓	✓	✓
Togo	-3.24	7.29	✓	✓		✓
India	-2.78	7.59				
Pakistan	-2.48	6.24				
Haiti	-2.40	6.06	✓	✓	✓	✓
Liberia	-2.40	5.45	✓	✓		✓
Dem. Rep. of Congo	-2.15	4.73	✓	✓	✓	✓
Benin	-2.15	5.46	✓	✓		
Central African Rep.	-2.13	4.85	✓	✓	✓	✓
Ghana	-2.03	8.18	✓			
Yemen	-1.94	4.60		✓	✓	✓
Iraq	-1.92	8.09			✓	✓
Cote d'Ivoire	-1.87	5.58	✓	✓		✓
Cambodia	-1.73	5.69		✓	✓	
Morocco	-1.67	5.80				
Sierra Leone	-1.65	4.99	✓	✓		
Egypt	-1.47	7.86				
Nepal	-1.46	4.96		✓		
Syria	-1.45	7.53			✓	✓
Senegal	-1.44	3.62		✓		
Mauritania	-1.42	5.23	✓	✓	✓	
South Korea	-1.30	12.76				
Gambia	-1.29	4.42	✓	✓		✓
Papua New Guinea	-1.29	4.92	✓		✓	✓
Republic of Congo	-1.29	6.59	✓		✓	✓
Tunisia	-1.20	8.08				
Bolivia	-1.15	8.86			✓	
Niger	-1.10	2.40	✓	✓		
Sudan	-1.06	3.78	✓		✓	✓
Guatemala	-1.00	5.32			✓	

Notes. 2010 GAP denotes the female-male gap in average schooling years in 2010. MALE ED. denotes the average male schooling years in 2010. LIFE EXP., PC GDP, and CPI denote countries that are in the bottom quartile on measures of life expectancy at birth in years in 2017, PPP-adjusted GDP per capita (constant 2011 international \$) in 2017, and corruption perceptions index in 2018 respectively. FRAGILE denotes all countries that are designated as “fragile situations” by the World Bank in 2019. Data for 2010 GAP and MALE ED. come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD. Data for LIFE EXP., PC GDP come from the World Bank’s World Development Indicators Dataset. Data for CPI come from Transparency International’s Corruption Perceptions Index.

Table 3: Linear Projections of Future Gender Gaps

COUNTRY	GAP IN 1960	GAP IN 1985	GAP IN 2010	FIRST YEAR W/O GAP
Trinidad and Tobago	-0.39	-0.07	-0.00	2002
Finland	-0.16	-0.59	-0.00	2007
Kazakhstan	-1.22	-0.80	-0.17	2007
Kyrgyz Republic	-1.11	-0.74	-0.07	2007
Russia	-1.02	-1.22	-0.22	2011
Ecuador	-0.58	-0.54	-0.04	2011
Armenia	-0.77	-0.33	-0.15	2012
Ukraine	-1.11	-0.96	-0.04	2012
Hungary	-0.46	-0.70	-0.07	2013
Moldova	-1.03	-0.98	-0.11	2013
Brunei Darussalam	-2.69	-1.23	-0.26	2014
Slovakia	-0.82	-1.00	-0.03	2014
Latvia	-0.45	-0.39	-0.03	2015
Saudi Arabia	-3.00	-3.01	-0.54	2015
Zambia	-1.19	-2.28	-0.61	2016
Japan	-1.37	-0.83	-0.24	2016
Tonga	-0.57	-0.38	-0.21	2017
Malaysia	-2.62	-1.54	-0.45	2018
Czech Republic	-0.81	-0.74	-0.18	2020
Rwanda	-0.95	-0.99	-0.24	2020
Fiji	-1.00	-0.56	-0.16	2021
Iran	-0.81	-1.91	-0.39	2021

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COUNTRY	GAP IN 1960	GAP IN 1985	GAP IN 2010	FIRST YEAR W/O GAP
Zimbabwe	-0.84	-1.57	-0.44	2021
Bangladesh	-1.32	-1.81	-0.52	2021
Algeria	-0.55	-2.50	-0.66	2023
South Africa	0.03	-0.22	-0.08	2024
Tanzania	-1.83	-2.03	-0.80	2025
Poland	-0.59	-0.27	-0.04	2025
Sri Lanka	-1.49	-0.71	-0.35	2026
Jordan	-2.30	-1.90	-0.69	2027
Thailand	-0.97	-0.70	-0.14	2029
Romania	-1.11	-1.34	-0.60	2029
Hong Kong	-3.09	-1.58	-0.77	2031
Cuba	0.11	-0.61	-0.29	2031
Serbia	-2.07	-1.42	-0.80	2032
Laos	-1.62	-2.15	-0.92	2032
Syria	-1.37	-2.24	-1.45	2036
Kenya	-1.39	-2.01	-0.89	2037
Albania	-1.02	-0.82	-0.47	2037
Uganda	-1.20	-1.86	-0.94	2038
Indonesia	-1.23	-1.49	-0.90	2038
Croatia	-1.78	-1.63	-0.84	2039
Tunisia	-1.01	-2.22	-1.20	2042
Ghana	-1.08	-3.31	-2.03	2042

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COUNTRY	GAP IN 1960	GAP IN 1985	GAP IN 2010	FIRST YEAR W/O GAP
South Korea	-2.62	-2.10	-1.30	2046
Rep. of Congo	-1.41	-2.22	-1.29	2048
Malta	-1.04	-1.02	-0.60	2048
Mexico	-0.48	-0.71	-0.29	2049
Mauritius	-1.55	-1.30	-0.89	2049
Bolivia	-1.44	-1.93	-1.15	2050
Cameroon	-1.24	-1.78	-1.00	2050
Egypt	-0.99	-2.44	-1.47	2053
Taiwan	-2.73	-1.27	-0.87	2061
Vietnam	-1.56	-1.08	-0.68	2064
Senegal	-1.86	-1.68	-1.44	2065
Malawi	-0.87	-1.54	-0.87	2068
Nepal	-0.21	-2.07	-1.46	2071
Sudan	-0.64	-1.40	-1.06	2073
Burundi	-0.61	-1.08	-0.79	2084
Cambodia	-1.34	-2.22	-1.73	2090
Iraq	-0.60	-2.68	-1.92	2098
Cyprus	-2.13	-1.18	-0.44	2098
Papua New Guinea	-0.43	-1.64	-1.29	2098
Paraguay	-0.77	-0.44	-0.27	2108
Dem. Rep. of Congo	-1.32	-2.60	-2.15	2142
Colombia	-0.26	-0.17	-0.10	2156

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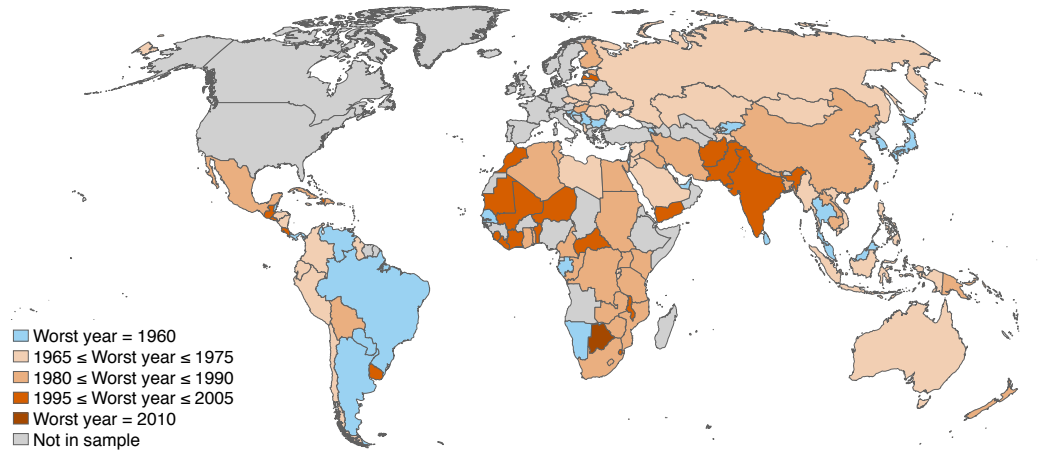
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COUNTRY	GAP IN 1960	GAP IN 1985	GAP IN 2010	FIRST YEAR W/O GAP
Maldives	-0.78	-0.64	-0.42	2162
Mozambique	-0.94	-1.14	-1.00	2358
Peru	-1.26	-1.09	-0.98	2377
Liberia	-0.75	-2.52	-2.40	3977
Cote d'Ivoire	-0.83	-1.95	-1.87	17040

Notes. GAP IN 1960, GAP IN 1985, and GAP IN 2010 denote the female-male gap in average schooling years in 1960, 1985, and 2010 respectively. FIRST YEAR W/O GAP denotes the year when the female-male gap in average schooling years is projected to be zero based on the linear trend between 1985 and 2010 for countries where the gap in 2010 is in favor of men and the gap has been shrinking between 1985 and 2010; these projections are not predictions — they are not meant to be taken literally in countries where linear projections suggest that the elimination of the gender gap is still decades, or even centuries, away. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.

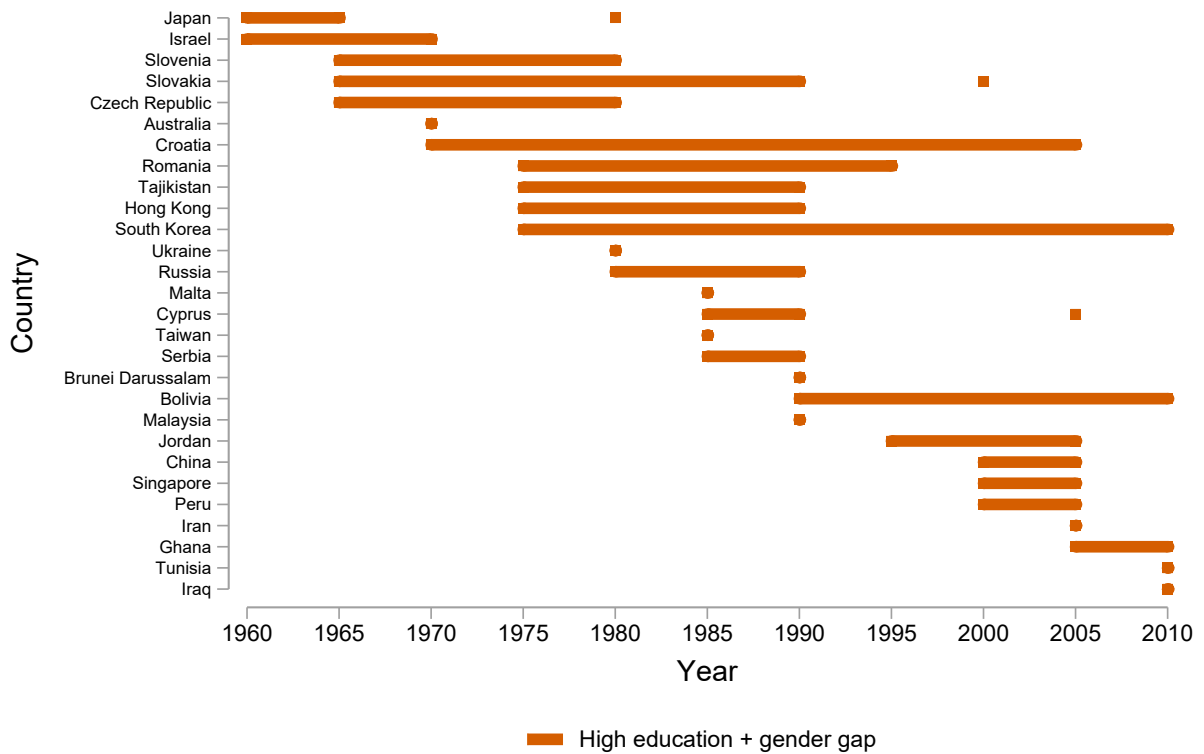
A Online Appendix

Figure A1: Year of Worst Gap Among Countries Where It Got Worse Before It Got Better



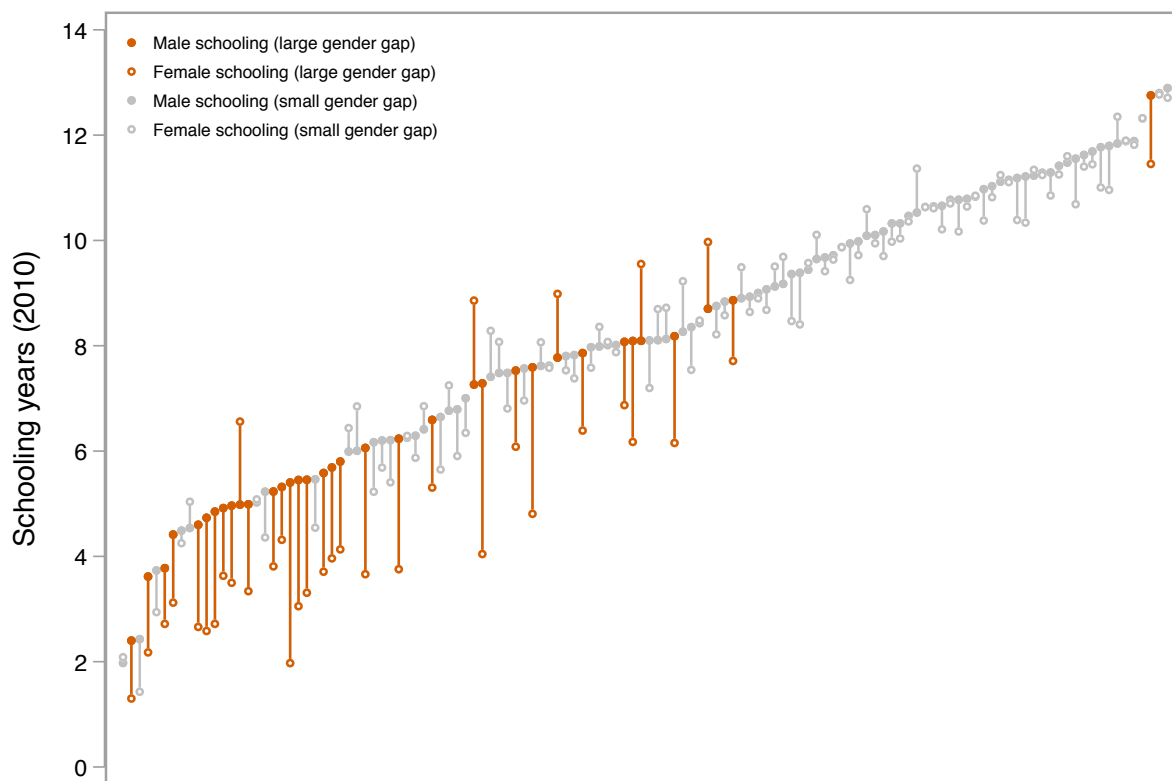
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. Countries are classified as experiencing the “worse before better” phenomenon if the year of the worst gap is after 1960 and the gap in 2010 is smaller than the worst gap. Countries where the gap “did not get worse before better” either had their worst gap in 1960 or 2010.

Figure A2: Countries Transition to and from the High Education and Big Gender Gap Status



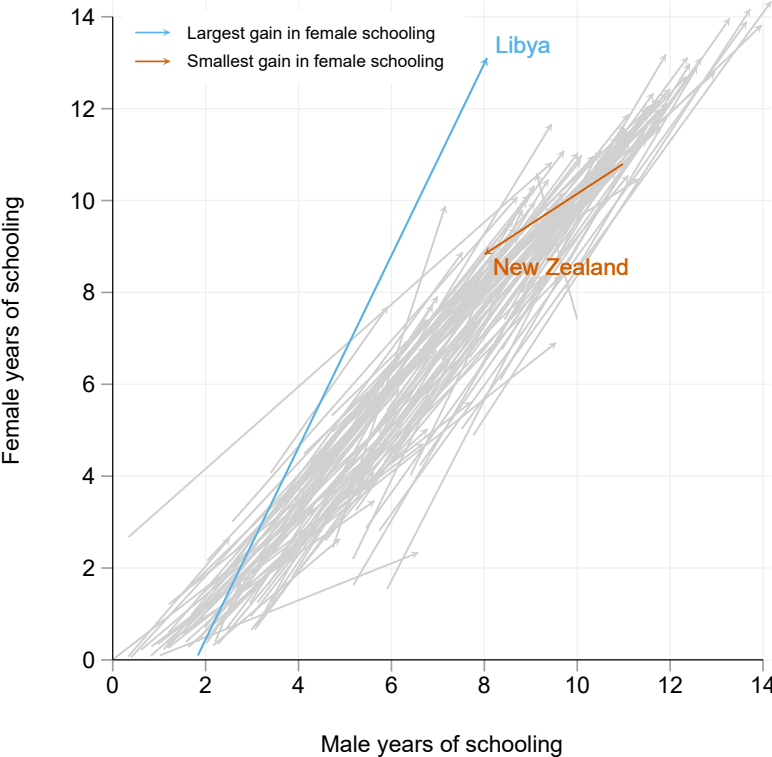
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. “High education” indicates countries where men have an average of more than eight years of education. “Gender gap” indicates a difference in male vs. female educational attainment (mean years of schooling) that is greater than one year.

Figure A3: Schooling Years and Gaps



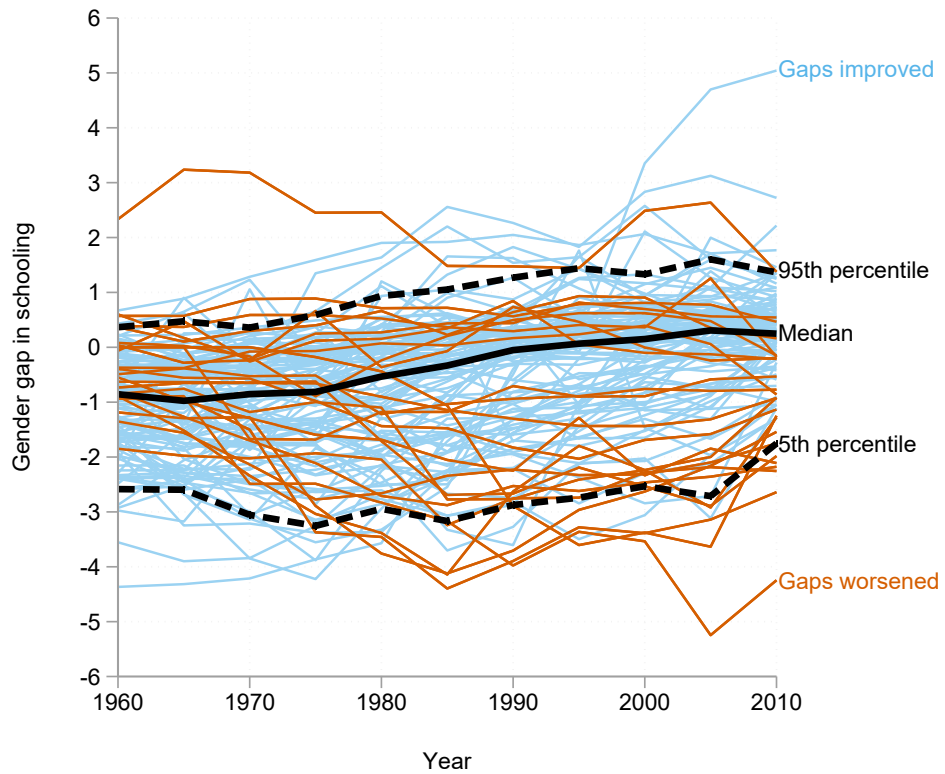
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. “Large gender gap” indicates a difference in male vs. female educational attainment (mean years of schooling) that is greater than one year.

Figure A4: Change in Average Schooling Years between 1960 and 2010 for Younger Cohort



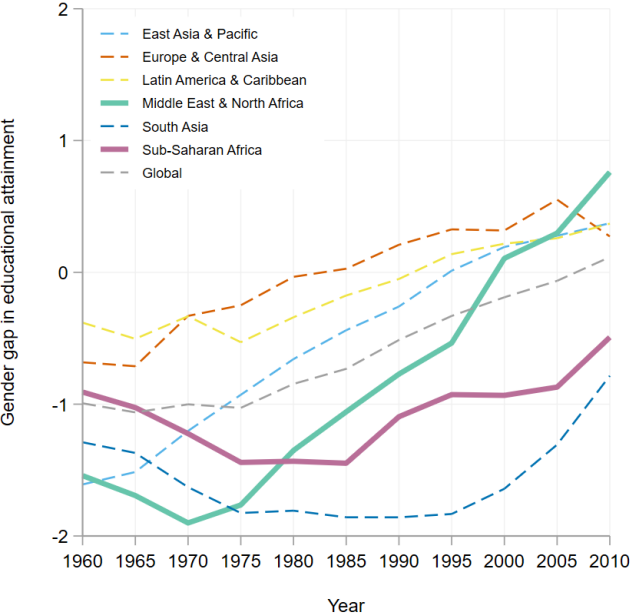
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. Female years of schooling is the average educational attainment among adult women aged 20-24; male years of schooling is the average educational attainment among adult men aged 20-24. For each country, the arrow connects the average level of educational attainment in 1960 to the average level of attainment in 2010.

Figure A5: Change in Gender Gaps in Educational Attainment for Younger Cohort



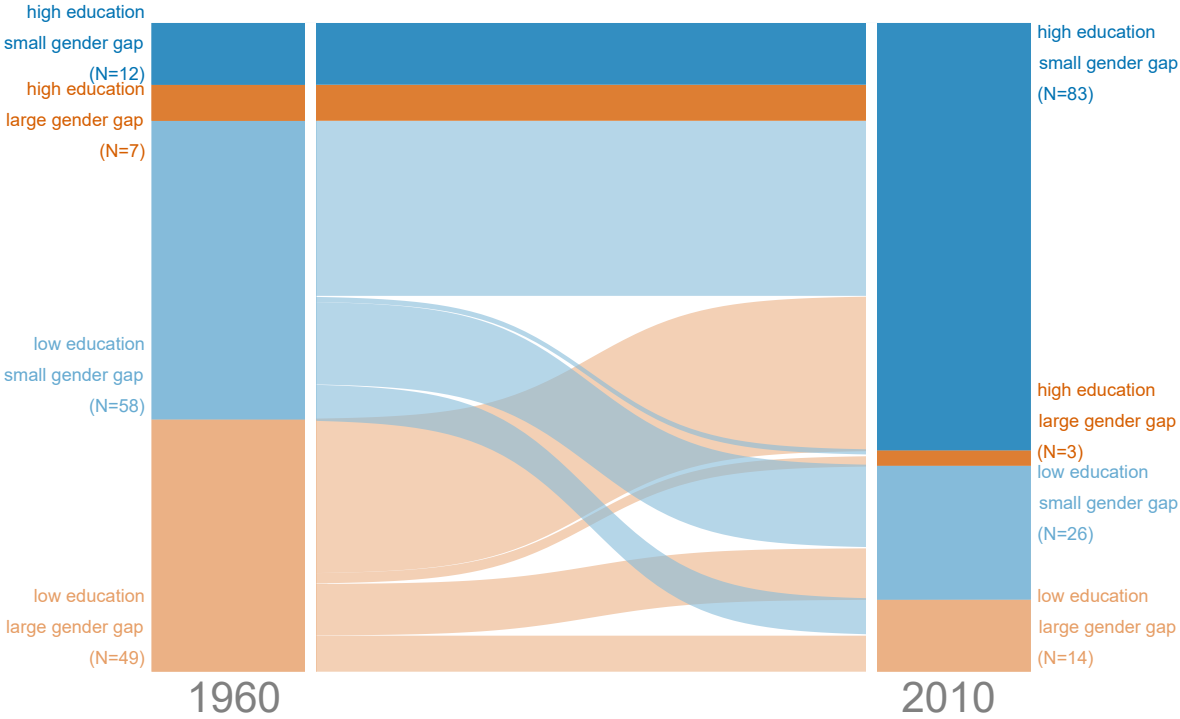
Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. The gender gap is the difference between average educational attainment (years of schooling) among women aged 20-24 and average educational attainment among young men aged 20-24. Orange indicates countries where women's educational attainment grew more slowly than men's between 1960 and 2010; light blue indicates countries where women's educational attainment grew faster than men's.

Figure A6: Regional Change in Gender Gaps in Average Schooling Years for Younger Cohort, 1960-2010



Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD.

Figure A7: Gender Gaps across Countries with High and Low Levels of Male Education for Younger Cohort



Notes. Sample includes 126 countries, all those included in the Barro-Lee Educational Attainment Data Set that were not founding members of the OECD. “High education” indicates countries where men have an average of more than eight years of education. “Large gender gap” indicates a difference in male vs. female educational attainment (mean years of schooling) that is greater than one year.

Table A1: Barro-Lee Sample Compared to UN Member State Sample

	BARRO-LEE SAMPLE	UN SAMPLE	DIFFERENCE
GDP per Capita (Mean)	20535	18453	2082
GDP per Capita (SE)	1764	1432	2250
Number of Countries	139	182	.
Literacy (Mean)	86	85	1
Literacy (SE)	2	1	2
Number of Countries	109	143	.

Notes. BARRO-LEE SAMPLE includes all the countries from the Barro-Lee Dataset that have available data on PPP-adjusted GDP per capita (constant 2011 international \$) (2017) or literacy (most recent year available since 2008) in the World Bank's World Development Indicators. Similarly, UN SAMPLE includes all such countries that are members of the United Nations. The calculation excludes from the Barro-Lee sample Hong Kong, Macao, and Taiwan — the only three states that are originally in the Barro-Lee sample but not in the UN sample.

Table A2: Change in Female Schooling Years

REGION	FEMALE SCHOOLING			
	1960	2010	CHANGE	SLOPE
East Asia & Pacific	3.04	8.67	5.63	1.22
Europe & Central Asia	5.07	11.08	6.00	1.18
Latin America & Caribbean	3.37	8.34	4.97	1.07
Middle East & North Africa	1.24	7.63	6.39	1.13
South Asia	1.09	5.08	3.99	0.86
Sub-Saharan Africa	1.05	4.90	3.85	0.95

Notes. 1960 denotes average schooling years for the female population in 1960. 2010 denotes average schooling years for the female population in 2010. CHANGE is calculated by subtracting female schooling years in 1960 from male schooling years in 2010. SLOPE is calculated by dividing the change in female schooling years between 1960 and 2010 by the change in male schooling years over the same time period. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.

Table A3: Top 3 Countries for Male Schooling Years By Region

REGION	COUNTRY	MALE		MALE	
		SCHOOLING YEARS IN 1960	GAP IN 1960	SCHOOLING YEARS IN 2010	GAP IN 2010
East Asia & Pacific	South Korea	5.57	-2.62	12.76	-1.30
	Hong Kong	6.43	-3.09	11.77	-0.77
	Japan	8.16	-1.37	11.69	-0.24
Europe & Central Asia	Czech Republic	8.80	-0.81	12.89	-0.18
	Slovakia	8.86	-0.82	12.80	-0.03
	Hungary	7.66	-0.46	11.89	-0.07
Latin America & Caribbean	Belize	7.74	-0.31	11.23	0.11
	Trinidad and Tobago	5.84	-0.39	10.64	0.00
	Cuba	3.94	0.11	10.32	-0.29
Middle East & North Africa	Israel	8.37	-1.45	12.32	0.01
	Malta	4.81	-1.04	10.77	-0.60
	Jordan	3.50	-2.30	9.94	-0.69
South Asia	Sri Lanka	4.70	-1.49	10.32	-0.35
	India	1.72	-1.21	7.59	-2.78
	Maldives	3.81	-0.78	6.29	-0.42
Sub-Saharan Africa	South Africa	4.38	0.03	9.72	-0.08
	Botswana	1.43	0.06	9.68	-0.26
	Mauritius	4.34	-1.55	9.36	-0.89

Notes. MALE SCHOOLING YEARS IN 1960 denotes average schooling years for the male population in 1960. GAP IN 1960 denotes the female-male gap in average schooling years in 1960. MALE SCHOOLING YEARS IN 2010 denotes average schooling years of the male population in 2010. GAP IN 2010 denotes the female-male gap in average schooling years in 1960. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.

Table A4: Ratio of Males to Females at Various Education Levels in 2010 (25-29 Year Olds)

REGION	RATIO OF MALES TO FEMALES		
	NO FORMAL EDUCATION	COMPLETE PRIMARY	COMPLETE SECONDARY
East Asia & Pacific	1.27	1.03	1.03
Europe & Central Asia	0.84	1.00	1.06
Latin America & Caribbean	4.56	0.99	1.10
Middle East & North Africa	1.64	0.97	1.24
South Asia	1.80	0.78	0.93
Sub-Saharan Africa	3.06	0.90	0.79

Notes. NO FORMAL EDUCATION denotes the ratio of percent of 25-29 year old female population with no schooling divided by percent of 25-29 year old male population with no schooling. COMPLETE PRIMARY denotes the female-male ratio of percent of population aged 25-29 that completed at least primary education. COMPLETE SECONDARY is defined analogously. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.

Table A5: Countries Where It Got Worse Before It Got Better

COUNTRY	GAP IN 1960	WORST GAP	YEAR OF WORST GAP	GAP IN 2010
Brunei Darussalam	-2.69	-2.71	1965	-0.26
Honduras	-0.31	-0.36	1965	0.03
Kazakhstan	-1.22	-1.25	1965	-0.17
Philippines	-0.55	-0.57	1965	0.59
Singapore	-2.38	-2.38	1965	-0.88
Myanmar	-0.75	-0.86	1965	0.50
Qatar	-1.18	-1.43	1965	1.46
Trinidad and Tobago	-0.39	-0.43	1965	-0.00
Vietnam	-1.56	-1.71	1965	-0.68
Guyana	-0.55	-0.79	1965	0.96
Barbados	-0.36	-0.46	1965	0.51
Bahrain	-0.92	-1.36	1970	0.48
Australia	-0.59	-1.12	1970	0.12
Jamaica	0.15	0.05	1970	0.46
Fiji	-1.00	-1.18	1970	-0.16
Czech Republic	-0.81	-1.59	1970	-0.18
Mongolia	-0.78	-1.47	1970	0.59
Slovakia	-0.82	-1.43	1970	-0.03
Jordan	-2.30	-2.66	1970	-0.69
Albania	-1.02	-1.20	1970	-0.47
Saudi Arabia	-3.00	-3.26	1970	-0.54
Russia	-1.02	-1.42	1970	-0.22

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COUNTRY	GAP IN 1960	WORST GAP	YEAR OF WORST GAP	GAP IN 2010
Ukraine	-1.11	-1.54	1970	-0.04
Indonesia	-1.23	-1.53	1970	-0.90
Reunion	0.29	0.12	1970	0.87
Ecuador	-0.58	-0.71	1970	-0.04
Poland	-0.59	-0.62	1970	-0.04
Chile	-0.30	-0.35	1970	-0.26
Mauritius	-1.55	-1.99	1970	-0.89
Lithuania	-0.91	-0.93	1975	0.02
Libya	-1.16	-2.65	1975	1.60
Nicaragua	-1.11	-2.54	1975	0.44
Colombia	-0.26	-0.35	1975	-0.10
Romania	-1.11	-1.89	1975	-0.60
Peru	-1.26	-1.47	1975	-0.98
Tajikistan	-1.71	-1.96	1975	0.50
Syria	-1.37	-2.56	1975	-1.45
Rwanda	-0.95	-1.27	1975	-0.24
Moldova	-1.03	-1.12	1975	-0.11
Burundi	-0.61	-1.23	1975	-0.79
Mexico	-0.48	-0.82	1980	-0.29
China	-1.38	-1.57	1980	-0.81
Iran	-0.81	-1.92	1980	-0.39
South Africa	0.03	-0.55	1980	-0.08

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COUNTRY	GAP IN 1960	WORST GAP	YEAR OF WORST GAP	GAP IN 2010
Rep. of Congo	-1.41	-2.36	1980	-1.29
New Zealand	-0.11	-0.52	1980	0.83
Bangladesh	-1.32	-1.94	1980	-0.52
Tanzania	-1.83	-2.43	1980	-0.80
Cameroon	-1.24	-1.80	1980	-1.00
Estonia	-0.11	-0.32	1980	0.51
Dominican Republic	0.03	-0.65	1980	0.59
Kenya	-1.39	-2.16	1980	-0.89
Laos	-1.62	-2.18	1980	-0.92
Bolivia	-1.44	-2.02	1980	-1.15
Mozambique	-0.94	-1.27	1980	-1.00
Malta	-1.04	-1.22	1980	-0.60
Egypt	-0.99	-2.44	1985	-1.47
Zimbabwe	-0.84	-1.57	1985	-0.44
Uganda	-1.20	-1.86	1985	-0.94
Cambodia	-1.34	-2.22	1985	-1.73
Tunisia	-1.01	-2.22	1985	-1.20
Papua New Guinea	-0.43	-1.64	1985	-1.29
Cuba	0.11	-0.61	1985	-0.29
Algeria	-0.55	-2.50	1985	-0.66
Sudan	-0.64	-1.40	1985	-1.06
Ghana	-1.08	-3.31	1985	-2.03

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COUNTRY	GAP IN 1960	WORST GAP	YEAR OF WORST GAP	GAP IN 2010
Iraq	-0.60	-2.68	1985	-1.92
Zambia	-1.19	-2.28	1985	-0.61
Dem. Rep. of Congo	-1.32	-2.60	1985	-2.15
Finland	-0.16	-0.92	1990	-0.00
Togo	-0.70	-3.24	1990	-3.24
Hungary	-0.46	-0.94	1990	-0.07
Nepal	-0.21	-2.41	1990	-1.46
Uruguay	-0.04	-0.98	1995	0.37
Liberia	-0.75	-2.88	2000	-2.40
Morocco	-0.30	-1.84	2000	-1.67
Malawi	-0.87	-1.64	2000	-0.87
Gambia	-0.34	-1.57	2000	-1.29
Benin	-0.63	-2.35	2000	-2.15
Niger	-0.62	-1.21	2000	-1.10
Latvia	-0.45	-0.60	2000	-0.03
Yemen	-0.03	-2.33	2005	-1.94
Afghanistan	-0.54	-3.62	2005	-3.43
Maldives	-0.78	-0.83	2005	-0.42
Sierra Leone	-0.40	-1.75	2005	-1.65
Central African Republic	-0.49	-2.35	2005	-2.13
Pakistan	-1.35	-2.62	2005	-2.48
Haiti	-0.49	-2.50	2005	-2.40

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COUNTRY	GAP IN 1960	WORST GAP	YEAR OF WORST GAP	GAP IN 2010
Eswatini	-0.39	-1.34	2005	0.06
El Salvador	-0.40	-0.98	2005	-0.39
Guatemala	-0.44	-1.04	2005	-1.00
Mauritania	-0.33	-1.97	2005	-1.42
Costa Rica	-0.10	-0.15	2005	0.06
Mali	-0.20	-0.76	2005	0.11
India	-1.21	-3.05	2005	-2.78
Cote d'Ivoire	-0.83	-2.08	2005	-1.87

Notes. GAP IN 1960 denotes the female-male gap in average schooling years in 1960. WORST GAP denotes the magnitude of the largest gap in favor of men among countries where the largest gap is after 1960 and gap in 2010 is smaller than the “worst” gap. YEAR OF WORST GAP denotes the year when the largest gap in favor of men appears. GAP IN 2010 denotes the female-male gap in average schooling years in 2010. Data come from all 126 countries in the Barro-Lee Educational Attainment Dataset that were not founding members of the OECD.