

Women Hold Up Half the Sky

- The Chinese proverb that ‘women hold up half the sky’ has long been more aspiration than fact. In developed and developing countries alike, gender gaps persist in education, health, work, wages and political participation.
- Education is key to gender equality. Educating girls and women leads to higher wages; a greater likelihood of working outside the home; lower fertility; reduced maternal and child mortality; and better health and education. The impact is felt not only in women’s lifetimes, but also in the health, education and productivity of future generations.
- At the macroeconomic level, female education is a key source of support for long-term economic growth. It has been linked to higher productivity; higher returns to investment; higher agricultural yields; and a more favourable demographic structure. The economic growth that results from higher education feeds a virtuous cycle, supporting continued investments in education and extending the gains to human capital and productivity.
- In the BRICs and N-11 countries, greater investments in female education could yield a ‘growth premium’ that raises trend GDP growth by about 0.2% per year. Narrowing the gender gap in employment—which is one potential consequence of expanded female education—could push income per capita as much as 14% higher than our baseline projections by 2020, and as much as 20% higher by 2030.

Important disclosures appear at the back of this document

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I. Introduction: If Women Did Hold Up Half the Sky

The Chinese proverb that ‘women hold up half the sky’ has long been more aspiration than fact. Around much of the world, women lag men in terms of education, access to healthcare, work, wages and involvement in political institutions. Although evolving views of women’s roles over the past half-century have moved the reality closer to the aspiration, there are still significant gaps in many countries.

Gender equality can be viewed in many ways: as a development goal in its own right; as a means of achieving other development goals; and as a fundamental human right recognized by international treaty.¹ It also has a key role to play as a source of support for long-term economic growth. Bringing more women into the labor force could provide a substantial boost to GDP growth and per capita income. Productivity levels would likely rise as higher competition for jobs raised the average quality of the overall workforce. In countries with younger populations, greater gender equality is associated with the start of the ‘demographic transition,’ which is typically a period of rapid economic growth.

Education is key to gender equality. Arguably, ‘there may be no better investment for the health and development of poor countries around the world than investments to educate girls.’² Over a range of countries at different stages of development, female education has been linked to higher wages; a greater likelihood that women will work outside the home; lower fertility; reduced maternal and child mortality; and better health and education, not only for women, but also for their children. At the macroeconomic level, female education is associated with higher productivity, higher returns to investment, better agricultural yields and a more favorable demographic structure. As education supports economic growth, growth in turn supports further improvements in education and health, creating a virtuous circle that extends the gains to human capital and productivity.

Primary and secondary schooling is well-recognized as the cornerstone of these social and macroeconomic shifts. Less attention has gone to tertiary education, which can play a key supplemental role. While it cannot substitute for investments in earlier education, tertiary education has a unique role to play in teaching business and management skills, and in expanding a country’s ‘absorptive capacity,’ which leads to higher productivity levels.

We have written before on the scope for investments in women’s health and education, and for economic gains from higher female participation in the labor force.³ In this paper, we assess the potential economic impact of female education on the BRICs and N-11 countries.⁴ We do this by benchmarking the magnitude of the ‘growth premium’ that women’s education could generate – if the right policies are in place. We estimate this in three ways:

- Because educated women are more likely to work, we look at what happens if the gender gap in employment shrinks over the next two decades. This could translate into higher rates of GDP growth and higher income per capita, most notably in India and Brazil among the BRICs, and in Egypt, Iran, Nigeria, Pakistan and Turkey among the N-11.

1. 185 countries have ratified the UN Convention on the Elimination of All Forms of Discrimination Against Women.

2. Herz and Sperling, 2004, *What Works in Girls’ Education: Evidence and Policies From the Developing World*. Council on Foreign Relations.

3. Our previous research includes ‘Women Hold Up Half the Sky,’ *BRICs Monthly* 07/05, May 2007; ‘Gender Inequality, Growth and Global Aging,’ *Global Economics Paper* 154, April 2007; and ‘Womenomics: Japan’s Hidden Asset,’ *Japan Portfolio Strategy*, October 2005.

4. The BRICs are Brazil, Russia, India and China. The N-11 (for ‘Next 11’) are Bangladesh, Egypt, Indonesia, Iran, Korea, Mexico, Nigeria, Pakistan, Philippines, Turkey and Vietnam.

- We also look at the impact of female education on our Growth Environment Scores⁵, assuming not only that more girls attend school, but also that female education leads to longer life expectancy (for women and men) and wider use of technology. Looking backward, if this had been true in the BRICs and N-11 over the past decade – if they had experienced a ‘more perfect world’ – trend real GDP growth could have been about 0.2% higher, with the biggest increases in Bangladesh, India, Pakistan, Philippines and Vietnam.
- Finally, we consider the ‘demographic transition,’ a powerful effect caused by falling fertility. This is a one-time transition, but one that can last for decades and has been shown to have been a key contributor to the ‘miracle growth’ in East and Southeast Asia. Historical experience suggests that it could translate into as much as an additional 1.0-2.0ppt of annual economic growth in countries that are in the early stages of this transition today: Bangladesh, Egypt, India, Iran, Nigeria, Pakistan and Philippines, along with much of sub-Saharan Africa.

The paper is structured as follows: we begin with a snapshot of women’s education and work across the BRICs and N-11 countries today. We then discuss the wide-ranging impact of female education and the channels by which it affects economic growth. Drawing on these findings, we estimate the ‘growth premium’ that higher female education could generate in the BRICs and N-11. We also consider steps governments and the private sector can take to help realize this potential.

II. Women’s Worlds Today

The first stop on the route to gender equality in the labor force is school. In many developing countries, however, school is the first stop on the route to gender *inequality*. Gender gaps in access to education are visible as early as primary school and are generally most acute in tertiary education (though what stands out most starkly here is the paucity of tertiary education for all).

Gender is only one factor affecting access to education. Income, geography, age, parental education and cultural norms also play a role. We discuss some of these obstacles in the Box on page 8. What is interesting to note here is that most of the differences in international standardized test scores are found across countries than across genders. In countries where boys do well, girls also tend to do well, and vice versa. Boys tend to do slightly better in math, and girls slightly better in reading. Because the reading gap is bigger than the math gap, girls generally outperform boys in aggregate.

This makes access to education a critical issue, and many countries have made significant progress in recent decades. The gender gap in education in Latin America has essentially vanished in recent decades, for example. But the gap persists in parts of our BRICs and N-11 universe, especially in Egypt, Nigeria, Pakistan and Turkey. While enrollment rates for boys are nearly universal, girls are disproportionately kept out of school. And the girls who do attend primary school are far less likely to complete it than are boys in Egypt, India, Nigeria, Pakistan and Turkey (though notably more likely in Iran and Philippines).

In secondary school, total enrollment rates fall off sharply. Just three-quarters of secondary-school-aged girls attend school in China, half in India and Bangladesh, and less than one-third in Nigeria and Pakistan. Because boys are more likely to continue their schooling, there are roughly eight girls for every 10 boys in secondary school in India, Nigeria, Pakistan and Turkey. Elsewhere, however, girls are evenly or disproportionately represented, including Bangladesh, Brazil, China, Korea, Mexico, Philippines, Russia and Vietnam.

5. See ‘Building on a Decade of Progress: Our 2007 GES Scores’, *Global Economics Paper* 163, December 14, 2007; and ‘You Reap What You Sow: Our 2006 Growth Environment Scores (GES)’ *Global Economics Paper* 148, November 8, 2006.

Despite Improvement, Girls Still Lag Boys in Primary School Completion Rates

% completing primary school	Girls		Boys	
	1991	2004	1991	2004
Sub-Saharan Africa	47.1	56.9	62.3	67.3
East Asia & Pacific	92.3	96.3	92.3	95.8
Europe & Central Asia	92.9	92.6	94.3	96.5
LatAm & Caribbean	88.4	101.1	83.0	99.4
Middle East & North Asia	73.3	89.0	87.8	92.9
South Asia	68.3	83.0	90.4	90.2
Total	78.6	84.0	93.4	89.4

Population-weighted regional averages. Source: World Bank

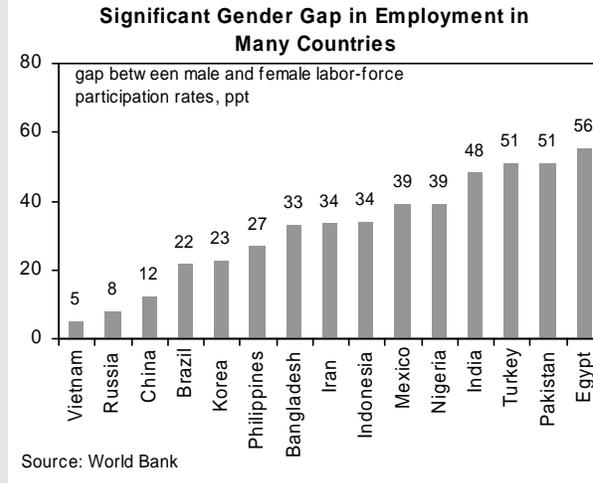
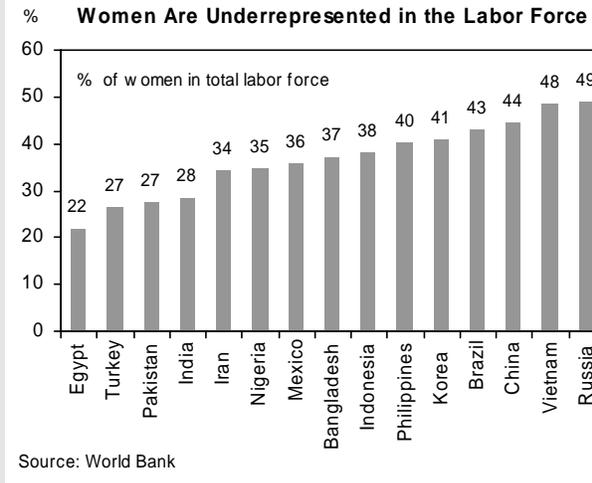
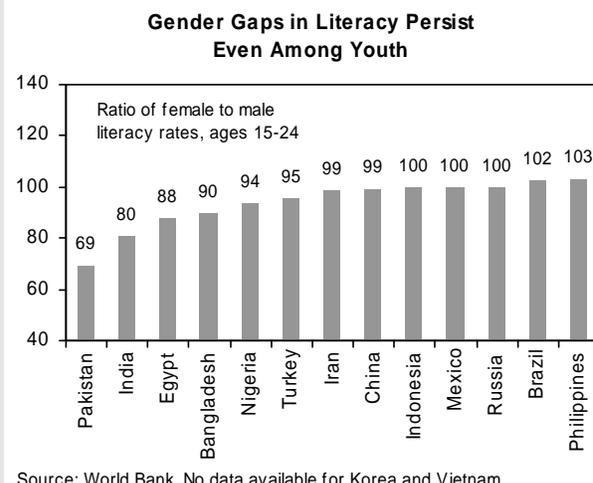
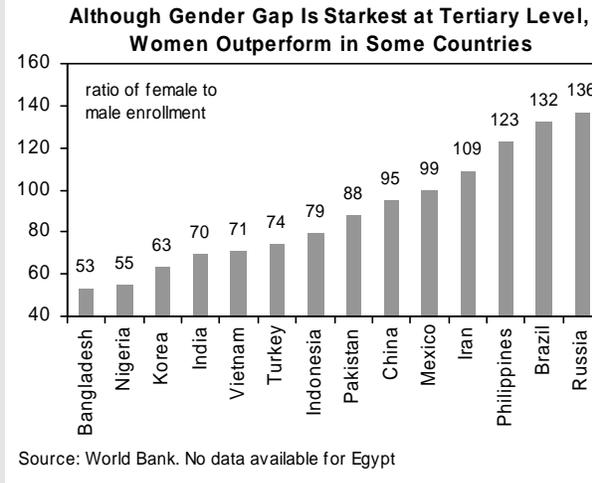
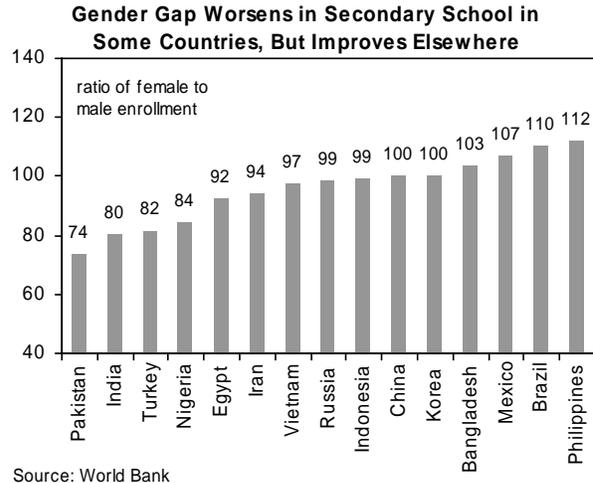
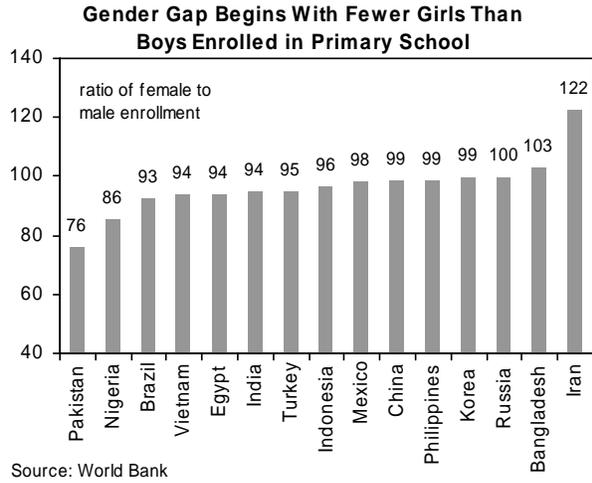
By university level, overall enrollment levels again drop sharply for both genders, and the gender gap widens. Outside of Russia and Korea, less than one-third – generally far less – of university-aged men and women are enrolled in tertiary education. In Bangladesh and Pakistan, just 4% of college-aged women are in school; men do not fare much better, at 8% and 5%. In some countries, women’s enrollment lags men’s significantly. For every 10 men in tertiary education, there are just five women in Bangladesh and Nigeria and seven in India, Turkey and Vietnam. This stands in contrast to the situation in middle- and high-income countries, where women typically outnumber men in tertiary education (by 20% on average in high-income countries). This pattern holds in higher-income countries among BRICs and N-11: for every ten men in universities, there are nearly 14 women in Russia, 13 in Brazil and 12 in Philippines (though only six in Korea, showing that income is just one factor).

Once women leave school, at whatever level, they face a gender gap in the labor force. In countries where the level of human capital among women is low, it is not surprising to find low rates of female employment. Thus only 30%-40% of working-age women (aged 15-64) in India, Pakistan and Turkey are in the labor force, and just 22% in Egypt. In contrast, in countries where female education rates are higher, women’s labor-force participation rates are higher, often much higher: nearly 80% in China and Vietnam, and 65% in Russia. But other factors are clearly at play too: for example, despite high levels of female educational attainment, only 42% of women in Iran are employed.

This means that differentials in employment can be stark. Measured in terms of the gap between male and female participation in the labor force, the differential ranges from just 5ppt in Vietnam (one of the smallest gaps in the world) to more than 50ppt in Egypt, Pakistan and Turkey. Women make up less than 30% of the total labor force in some countries, and they are often concentrated in the low-productivity and low-paid agricultural sector. For example, women make up less than one-quarter of the non-agricultural workforce in Egypt, India, Iran, Pakistan and Turkey. There is a gender gap in wages as well, with women earning far less than men in manufacturing jobs across a range of countries, and rural women tending to be unpaid laborers on family farms.

As we discuss below, women’s education affects economic growth across multiple channels. Favoring boys’ education over girls’ may seem sensible in countries where social safety nets are limited or where gender roles are heavily influenced by tradition. But the lower level of human capital that results from this bias leads to foregone economic returns at the household level and foregone growth at the national level.

Gender Gaps Are Visible in Schooling and in the Workforce



The Importance of Tertiary Education

Primary and secondary education has been the focus of many development projects – and rightly so. Getting primary and secondary education right yields the greatest benefits to the greatest number of people. Some of the most important effects of education, particularly the demographic transition, are unlikely to occur without widespread access to early-stage education.

Tertiary education typically receives less attention, in part due to capacity constraints and costs. Expanding capacity will take time and money, but it can be done. In China, for example, the number of students in tertiary education has risen seven-fold since 1990, and the share of secondary-school graduates progressing to universities has soared, from one-quarter in 1990 to three-quarters in 2006.

Tertiary education provides an important supplement to earlier education, because it fills a need that primary and secondary education cannot. Tertiary education is important for the development of new knowledge and the adaptation of new technologies; the World Bank argues that it has a ‘direct influence on national productivity.’

As the source of research most responsive to local conditions, tertiary education can drive improvements in agricultural productivity, health and the environment. Tertiary education can also build skills that rarely feature in the primary or secondary curriculum, especially business skills. As globalization raises the demand for educated workers, tertiary education is likely to become even more important. And at the individual level, successful educated women become role models, inspiring and supporting other women.

III. The Importance of Educating Girls and Women

The benefits of educating girls and young women are wide-ranging and well-documented. As the World Bank notes, ‘Girls’ education yields some of the highest returns of all development investments, yielding both private and social benefits that accrue to individuals, families and society at large.’ Around the world, girls’ education has been linked to later marriage; lower fertility; reduced child and maternal mortality; better nutrition and health; higher employment rates; higher wages; and greater political participation. Female education also has strong intergenerational benefits, with the impact felt not only in women’s own lifetimes, but also in the health, education and productivity of future generations. The economic growth that results from higher education feeds a virtuous cycle that supports continued improvements in education and health.

We have captured some of these benefits in our Growth Environment Scores (GES), which produce an objective summary measure of conditions that help countries to achieve their economic growth potential. All of these factors are objectively measurable and have a proven link to economic growth. The 13 criteria in our GES include education, life expectancy and use of technology – all of which are affected by female education. The theme of female education also runs throughout the Millennium Development Goals (MDGs), which include achieving universal primary education; eliminating gender disparities in education; reducing child and maternal mortality; and improving youth employment – all of which again are influenced by female education.

Channels for Growth: Household Gains...

At the individual or family level, girls’ education improves household welfare through multiple channels:

- **Higher wages and better jobs.** Women’s wages increase with schooling, in many cases faster than men’s. Although education cannot explain all of the wage gaps with men, the returns from an extra year of schooling are proportionately higher for women than for men, particularly at the secondary level. Studies conducted around the world find the rate of return for each additional year of schooling to be roughly 10%. That is a global average; in developing countries with lower starting levels of human capital, returns tend to be higher. Education also increases the likelihood that women will have white-collar and public-sector jobs, and helps them to move away from domestic or informal-sector employment.

- **Lower fertility.** Educated women have fewer children: for every two to three years of education, a woman is likely to have one less child. Women with a secondary or higher education also tend to delay marriage and to have more control over the spacing of children, which leads to better health for both the mother and child. In contrast, male schooling has an insignificant or even positive effect on fertility.
- **Lower mortality.** Maternal mortality, which is a significant cause of death in young women, declines because educated women are far more likely to receive antenatal and postnatal care, and to have the help of skilled attendants as they give birth. The World Bank estimates that an additional year of schooling for 1000 women helps prevent two maternal deaths. Infant and child mortality is lower in countries where mothers have some primary schooling, and much lower where they have secondary schooling. The positive impact of maternal education is twice as large as that for paternal education.
- **Better health.** Education allows mothers to make better medical decisions and better use of medical services for both themselves and their children. In fact, female education may play a larger role in malnutrition than even food availability. Families of educated women are found to have better nutrition and diets, safer sanitation practices and a higher chance of being immunized. Girls' education is also linked to a lower rate of HIV/AIDS infection.
- **Entrepreneurial success.** Global studies of entrepreneurship show that higher education improves the chances that a female-run entrepreneurial business will make the transition from start-up to established business. Education also increases the productivity of self-employed workers.
- **Intergenerational benefits.** Across both developed and developing countries, studies consistently show that women allocate more resources to food and to children's health and education than do men. Mothers with education are more likely to educate their own children, and these children are likely to study more. These 'intergenerational benefits' can be among the most powerful results of female education, as the impact compounds through subsequent generations.

... Combined With Macroeconomic Effects...

At the macroeconomic level, female education supports growth through several channels:

- **More working women.** The more education a woman has, the more likely she is to work. This makes sense, since education increases the opportunity cost of *not* working. Vocational and tertiary degrees seem to have the greatest impact on women's inclination to work; at this level, women's labor-force participation rates are on a par with men's, especially in cities.

Returns to Investment in Education Are Highest in Developing Countries

% private return to education by level	Primary	Secondary	Higher
Asia*	20.0	15.8	18.2
Europe + MENA*	13.8	13.6	18.8
LatAm/Caribbean	26.6	17.0	19.5
Sub-Saharan Africa	37.6	24.6	27.8
World	26.6	17.0	19.0

* Non-OECD

Source: Psacharopoulos & Patrinos 2004

Returns to Education Are Higher for Women Overall

% annual returns	Men	Women
Primary education	20.1	12.8
Secondary education	13.9	18.4
Higher education	11.0	10.8
Overall	8.7	9.8

Source: Psacharopoulos & Patrinos 2004

Why Aren't More Girls in School?

Girls' persistent under-enrollment across the educational spectrum is driven by a complex mix of factors, often lumped under the heading of 'culture.' Its prevalence across so many countries strongly suggests that parents think the returns to girls' education are limited, and lower than those for boys. This perception is in fact a misperception, and an unfortunate one at that. Repeated studies find that the returns to girls' education are higher than for boys. On average, returns to girls' education are estimated to be a full percentage point higher than those to boys' – if women have the opportunity to work. And the social returns to education are also significant.

So, if the returns to female education are so high, and so well-documented, why aren't more girls in school?*

Financial concerns are important. Direct (school fees) and indirect (books, transportation, uniforms) costs can be hefty, and they absorb a larger share of household income for poor families than for wealthier ones. In much of Africa, income disparities have a bigger impact on educational attainment than do rural/urban divides or even gender.

Apart from the direct and indirect costs, the opportunity costs of sending girls to school can be enormous. Girls can more easily substitute for women in housework and agriculture than boys can substitute for men in wage-paying jobs. Studies in Africa show that girls typically work far longer hours than boys, and that boys spend those extra hours in school while girls are at home or in the fields. In many societies, the skills girls learn working in the home are ones they are expected to have during marriage, so this work may be seen as an important part of their 'education.'

Girls' enrollment in school is highly sensitive to income, with small increases in household income having a larger

impact on girls' enrollment than on boys', and girls' enrollment being more sensitive to economic crises. For instance, research in India shows that a 1% increase in per capita household income raises the probability of girls' enrollment in middle school by 4ppt, compared to just 1ppt for boys'. In Malaysia, the same 1% increase in household income boosts the probability that girls will attend school by 18-20ppt, against just 5-6ppt for boys.

Whether women can realize economic returns on their education is also subject to the structure of the job market. If formal employment opportunities are limited, whether by economic slowdowns or by discriminatory labor regulations and practices, it may be impossible for them to gain the full benefits of their education. This risks devaluing female education in the eyes of parents making decisions about their own children's education. This is why 'helping women work,' as we discuss later in this paper, is such an important adjunct to investments in education. The quality of the teachers and the relevance of the curriculum will also play into parents' calculations of expected returns.

Other obstacles fall more clearly into the 'cultural' bucket. Among them: the fact that women may 'transfer out' of their own families upon marriage, allowing their husbands' families to reap the returns on their education; concerns about safety and hygiene (especially the availability of toilets); a shortage of female teachers; and the portrayal of girls and women in the curriculum. For example, in some textbooks 'males are rarely portrayed doing household chores, while happy women are rarely shown doing anything else. Males are portrayed as liberators, leaders, heroes, problem solvers and inventors, as adventuresome and proactive. Girls are frightened, inept in the use of technology, easily duped or surprised, need to be rescued, and shown crying or in distressing situations.'

* For a thoughtful discussion of the factors behind constraints on girls' education in Africa, see Kane 2004, 'Girls' Education in Africa: What Do We Know About Strategies That Work?', World Bank.

Education Increases the Likelihood That Women Will Work

Female labor-force participation rate, %*	Argentina	Chile	Colombia	Costa Rica	Ecuador	Guatemala	Panama	Peru	Uruguay	Venezuela
Less than primary schooling	22	..	11	17	44	21	10	39	29	32
Primary schooling	31	24	20	22	46	22	14	39	35	34
Secondary schooling	33	33	34	31	47	41	34	40	47	63
University schooling	58	61	53	38	49	47	48	63	54	87

*Marginal effects or predicted probabilities of female labor-force participation depending on education, controlling for other variables.

Source: Psacharopoulos & Tzannatos 1992

- **Stronger human capital and higher productivity.** Educating girls raises the overall quality of the students and ultimately that of the aggregate workforce. Better health also improves the quality of human capital.
- **Higher returns to investment.** Returns to investment are generally higher in countries with higher levels of human capital. Moreover, the combination of female education and pervasive wage discrimination can create a pool of well-skilled but inexpensive female labor. In itself, this may lead to more investment in industries dominated by female labor. Higher returns to industries that fed on female-intensive light manufacturing played a role in the rapid growth rates seen in Southeast Asia.
- **More productive agriculture.** Educated women make better farmers, achieving higher yields, presumably because they are more open to the spread of new technology and techniques. This makes girls' education in rural areas especially important in regions like South Asia, where agriculture absorbs more than 60% of the workforce but makes up less than 20% of the economy.
- The **'demographic transition'**, which is the impact of declining fertility played out in the society at large.⁶ Declines in mortality and fertility allow the working-age share of the population (aged 15-64) to grow more quickly than the overall population. This tends to increase savings and per capita income. The demographic window eventually closes as this large working-age population retires, making this a one-time gain – but a powerful one that plays out over several decades. It was a key driver of growth in East Asia after 1960, where studies attribute about one-quarter of the 'miracle growth', and one-third of the increase in per capita income, to the demographic transition. The demographic dividend has mattered in industrialized countries as well, for instance by contributing about 0.67ppt to annual growth in the US during the peak years of 1985-1990.

... Have a Major Impact on Economic Growth

Taken together, the benefits of female education at both the individual and the macro level show how gender inequality hurts economic growth. Of course it could be true that low economic growth is responsible for low levels of female education, but a range of studies have found the opposite – that low female education is a contributing factor to slower economic growth. As growth takes hold, causation can run both ways – education raises growth, and growth allows for better education.

6. The demographic transition has been experienced by developed and developing countries alike. It begins when improvements in health and sanitation cause mortality to drop. Fertility typically begins to decline soon thereafter. As the working-age share of the population (aged 15-64) grows, demand for capital equipment and infrastructure rise – as does per capita income. With a smaller number of dependents to be supported, the supply of savings in the economy can rise. This demographic dividend eventually fades as the working-age population ages and retires. A country is considered to be in the 'demographic window' when young people (under age 15) make up no more than 30% of the total population, and elderly people (age 65 or older) are no more than 15% of the total. There can also be an enduring 'second demographic dividend' if the higher income is invested in physical and/or human capital.

Estimates of the growth premium from gender equality in education – or the growth discount from stark gender inequality – generally converge at about 0.3ppt per year. A range of studies conclude that:

- A one percentage point increase in female education raises the average *level* of GDP by 0.37ppt and raises annual GDP growth *rates* by 0.2ppt on average.
- At the high end of estimates, the direct and indirect effects of gender inequality in education may have reduced potential annual per capita income growth by 0.5-0.9ppt in much of South Asia, sub-Saharan Africa, the Middle East and North Africa. In Africa, this means that actual per capita income growth was only half its potential level. Other studies put the overall impact at 0.3ppt of annual growth in South Asia and sub-Saharan Africa.
- Countries that are farthest from meeting the Millennium Development Goals on gender equality in primary and secondary education could, if they had made better progress, have raised their average annual growth rates by 0.1-0.3ppt between 1995-2005, and continued progress would increase growth by 0.4ppt annually from 2005-2015.
- The economic impact of the ‘demographic transition’ can be significant. Some studies estimate that it contributed as much as 1.4-1.9ppt of annual growth in GDP per capita in East Asia, and 1.1-1.8ppt in Southeast Asia, from 1965-1990.

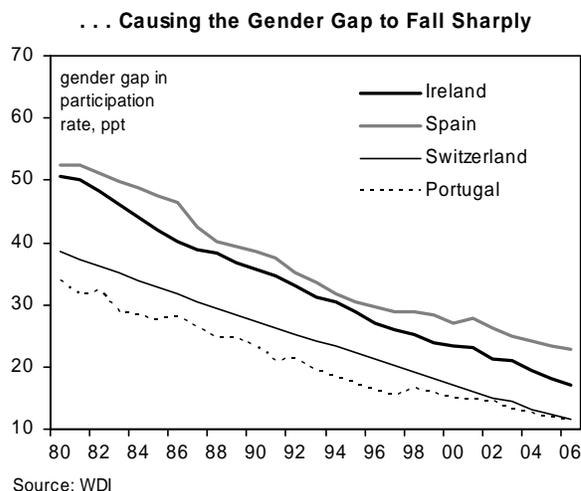
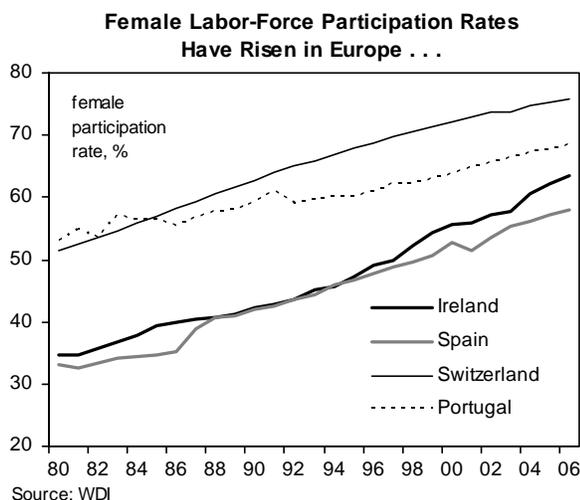
IV. The Impact of Female Education in the BRICs and N-11

We proceed with caution in tracking the results of these studies into economic growth estimates, given the tremendous variations in gender inequality and social expectations across our BRICs and N-11 universe. For instance, it is hard to imagine that the impact of expanding female education in China – where the gender gap is small – would be quantitatively or even qualitatively the same as in Pakistan, where 25% of girls do not even attend primary school. Cultural, religious and social preferences also mean that some societies will choose to stop short of full gender equality, in education or in other fields.

These reservations notwithstanding, we can assess the impact of women’s education on economic growth in several ways: through the impact of more women in the labor force; through improvements in education, health and productivity; and, in some countries, through the effects of the demographic transition. Our numbers are meant to be illustrative rather than to be precise point estimates. We are seeking to benchmark the magnitude of the improvement – the growth premium – that could be achievable if the right policies and investments are pursued.

When More Women Work

We begin by looking at the impact of higher female participation in the labor force, using the long-term growth model developed in our BRICs work. We start with the current gender gap in labor-force participation rates, which ranges from less than 10ppt in Vietnam and Russia, to more than 50ppt in Turkey, Pakistan and Egypt (as shown in the charts on page 5). We assume that the gender gap in each country narrows by half over the next decade (2008-2017) and then by half again over 2018-2027, while we hold men’s participation rates constant. Reducing the gender gap in this manner over 20 years would bring these participation rates close to parity in a handful of countries, including Vietnam, Russia and China, but would leave the gender gap at or above 10ppt elsewhere, including India, Egypt, Pakistan, Turkey, Nigeria and Mexico.



This assumption is probably more optimistic than historical experience would suggest. For example, gender gaps in Europe narrowed by half, on average, during the 1980s and 1990s, though they have continued to shrink in this decade. But our goal is to get a sense of how significant the change could be, not to map out a specific path or timing.

Over the next decade, narrowing the gender gap would allow the labor force to grow by an incremental annual average of 2.8% in Egypt, around 2% in Pakistan and Turkey, and more than 1.5% in Nigeria and Mexico. The pace of growth would slow in the second decade (2018-2027) but would remain significant in Egypt, Turkey, Pakistan and India.

Faster labor-force growth would then translate into higher GDP growth. Over the 20-year period, against our baseline forecast of unchanged gender inequality, the incremental gains in average annual GDP growth rates could be roughly 1.5% in Turkey and Egypt, and in the range of 1% in India, Iran, Mexico, Nigeria and Pakistan. Even China, where gender inequality is low, could see a 0.3% incremental increase in annual GDP growth.

The effects would also be seen in higher income per capita. In the BRICs, India is the standout: income per capita could be 10% higher than under our baseline scenario by 2020, and 13% higher than our base case in 2030. In Brazil the improvement could be about 5% by 2020. In the N-11, the standouts are Egypt and Turkey (14% higher than otherwise), along with Iran (11%) and Nigeria (9%). By 2030, income could be 20% higher than our baseline in Egypt and Turkey, and 16% higher in Iran.

Of course bringing so many women into the labor force is more than a question of expanding access to education. Governments intent on making the most of their investments in education would do well to facilitate women’s entry into the workforce. We discuss some relevant measures in the Box on the following page.

In a More Perfect World

We also look at the impact of greater gender equality through the lens of our Growth Environment Scores. As we noted before, the GES summarize many of the key drivers of productivity performance, including education, health and technology. We have previously used the GES to calculate a ‘growth premium’ – measuring the degree to which improvements in the GES components have contributed to growth. Our baseline figure for the growth premium is the difference between a country’s actual growth rate from 1997-2006 compared to

Helping Women Work

The full benefits of female education will not be felt if women do not have access to the workforce. While recognizing the broad consequences of female education, estimates of high returns to each year of schooling presume that women can put their education to work in paid employment. Accordingly, governments that want to realize the maximum gains from their investments in female education would do well to address obstacles that keep women in lower-paying jobs or out of the labor force entirely.

There is a wide spectrum of policies that can increase opportunities for women in the labor force – many of which benefit men as well. These include:

- Shortening the time and streamlining the processes required to start new businesses.
- Making the labor market more flexible and helping businesses to make the transition from the informal to the formal sector.
- Introducing – and enforcing – anti-discrimination laws.
- Equalizing retirement ages for men and women so that women are not forced out of the labor force early.
- Eliminating tax penalties on two-income families.

- Helping women to balance work with family obligations, through the provision of benefits like affordable child care, tax credits and maternity leave.

This is not only a government undertaking; the private sector also has a role to play, by:

- Offering education and on-the-job training. Programs targeted at working women can meet a real need for practical and managerial training, particularly if they focus on areas like finance, communications skills and management.
- Expanding women's access to credit, either directly through bank lending and microfinance, or indirectly through credit bureaus.
- Pursuing their own anti-discrimination policies and offering family-friendly benefits.

At the individual level, women can help each other – consciously or not – by serving as role models. Studies of entrepreneurship show that social capital and self-confidence are vital to the success of a start-up business. Accordingly, some of the most effective programs designed to support entrepreneurship among women focus on networking opportunities and the availability of role models.

what it could have been in 2006 *if* growth conditions (as measured by the GES) had been at 1996 levels. It is important to note that changes in GES scores are significantly more valuable at lower income levels (for instance a 1 point improvement in the GES is worth 1.8ppt in additional growth for a country with an average income of \$500 per capita, but only 0.5ppt for a country with an average income of \$10,000 per capita).

To estimate the impact of women's education, we raise the three relevant GES components, assuming (in a perfect world) that these improvements would have occurred over the decade 1997-2006:

- We increase life expectancy for both men and women by five years, reflecting improvements in mortality and overall health;
- We increase female enrollment rates by 10ppt, which on average gives a 5ppt overall increase in net secondary enrollment; and
- We assume that higher education leads to greater use of technology (while noting that the technology variables are highly sensitive to income), and so raise penetration rates for computers, mobile phones and internet use by 10%.

A higher GES translates into higher rates of GDP growth, although the impact on growth is relatively muted. This is because the GES has 13 components; improving only the three that are directly linked to female education, and only by these fairly modest increments we used, cannot transform a country's growth prospects overnight, or even over a decade. Nonetheless, trend rates of

If Education Pushes More Women Into the Labor Force, GDP Growth Rates and Income Per Capita Will Rise -- in Some Cases, Considerably

	Brazil	China	India	Russia	Bangladesh	Egypt	Indonesia	Iran	Korea	Mexico	Nigeria	Pakistan	Philippines	Turkey	Vietnam
Labor Force Participation Gap (ppt)															
2006	21.7	8.2	48.1	12.3	33.0	55.6	33.9	33.7	22.9	39.2	39.3	51.1	27.1	51.1	5.1
2017	10.9	4.1	24.1	6.1	16.5	27.8	17.0	16.8	11.5	19.6	19.6	25.5	13.6	25.5	2.5
2027	5.4	2.1	12.0	3.1	8.2	13.9	8.5	8.4	5.7	9.8	9.8	12.8	6.8	12.8	1.3
Additional Women in Labor Force (average annual increase as % of existing labor force)															
2008-2017	0.8	0.3	1.9	0.4	1.1	2.8	1.2	1.4	0.9	1.6	1.5	2.0	0.9	2.3	0.2
2018-2027	0.4	0.1	1.0	0.2	0.6	1.4	0.6	0.7	0.4	0.8	0.7	1.0	0.5	1.2	0.1
Average Annual Incremental Real GDP Growth Rates (%)															
2008-2027	0.7	0.3	1.0	0.4	0.6	1.4	0.7	1.2	0.6	0.9	0.9	0.8	0.7	1.5	0.5
Increase in Income per Capita Relative to Current GS Projections (%)															
2010	0.9	0.6	2.2	1.3	1.2	2.9	1.2	1.6	0.9	1.9	1.5	2.0	1.1	2.7	0.3
2015	3.0	2.1	6.5	3.0	4.7	8.4	4.0	5.9	2.9	5.3	5.4	5.5	3.4	8.3	1.5
2020	5.4	2.8	10.1	4.0	7.4	13.7	6.9	10.5	5.1	8.2	9.0	8.3	5.9	13.5	3.2
2025	7.7	3.5	12.6	3.9	8.8	18.1	8.9	14.2	5.8	10.1	11.8	10.9	8.1	17.8	4.8
2030	9.1	3.9	13.3	2.7	9.2	20.4	9.6	16.1	5.4	10.4	12.9	13.0	9.2	19.7	5.5

Source: GS calculations

real GDP growth over the previous decade could have been higher by 0.2% or more in Bangladesh, India, Pakistan, Philippines and Vietnam – if these countries had improved gender equality as we outline above.

Passing Through the Demographic Window

Finally, we assess the impact of the demographic transition, which has been one of the most powerful forces behind higher GDP growth and rising living standards throughout Asia. The demographic transition is a complex, multi-decade phenomenon. The timing of the ‘demographic window,’ the duration and intensity of the economic gain and the extent to which countries make the most of this opportunity will vary greatly. Thus, we will not attempt to provide precise point estimates of the transition’s economic impact. But we do note that multiple studies find that demographic factors have a strong and statistically significant impact on economic growth – if the right policies are pursued.

Most of the BRICs and N-11 countries are currently in the ‘demographic window’, meaning that the magnitude of the economic benefits they derive from it will turn in part on decisions they have *already* made about education and investment. Expanding female education will help them to make the most of this transitory period and to achieve the greatest gains in living standards. The window is already closing in a few of the BRICs and N-11, including Russia and Korea; China’s window will close in about 15 years time.

The most interesting story lies in those countries that have yet to enter the demographic window – Bangladesh, Egypt, India, Iran, Nigeria, Pakistan and Philippines. Much of sub-Saharan Africa also falls in this camp. Academic studies suggest that the demographic dividend, when it does come, could be on the order of an additional 1.0-2.0ppt of annual growth. While declining fertility and changing age structures may be foregone conclusions (though the impact of HIV/AIDS in Africa complicates this picture), the economic impact is not. Investments in education today, particularly in primary education, will help these countries to realize the maximum benefits. Indeed, while the demographic transition itself is inherently transitory, its impact on economic growth can be made more permanent by using the higher growth to invest in health and education, along with physical capital and innovation.

V. Conclusions

Though the benefits of educating girls and women are well-proven, translating this knowledge into reality is a complex task. Limited financial resources, cultural preferences and government policy all affect decisions about who has access to education and who has the opportunity to reap its full benefits. Greater gender equality will require not only investments in female education, but also changing attitudes in the workplace and new legislation. Progress in achieving gender equality will be measured in years, if not decades.

Nonetheless, it is clear that the economic impact of these investments and changes in mindset can be substantial. In countries with aging populations, changing women's status in the workforce can enhance otherwise-sluggish growth dynamics. In countries with younger populations, gender equality can help to accelerate economic growth, reduce poverty and save lives.

Moreover, better and broader education may be one of the most powerful responses to globalization. Weighing the impact of globalization on inequality, the IMF finds that greater access to education is associated with more equal income distributions. As economic openness and technological progress drive the shift from low-skilled to high-skilled occupations, education is the only way of meeting the growing 'skills gap'. This means that increased access to education, and higher-quality education, should be a policy priority.

Our estimates of the economic effects are based on a 'best case' that will not be achieved quickly. But they illustrate the potential scope of the growth premium – and what countries are leaving on the table by under-investing in female education.

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