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Bridging the Gender Gap in Education and Its Long-Run Impact on Economic Development: Evidence from South Asia

[1]Muhammad Kamran

[2]Zeeshan Ahmed

[1]MPhil Scholar Iqra University, Islamabad H9 Campus

[2]MPhil Scholor Iqra University, Islamabad H9 Campus

Abstract

This article examines the connection between gender equality in education and the long run economic development in South Asia. Based on conceptual frameworks of endogenous growth theory, and the human capital theory, the work provides a synthesis of the empirical studies on closing the gender gap in schooling and its impact on economic performance using both cross-country studies and panel-based studies, country-specific studies. The study concentrates on Bangladesh, India, Nepal, Pakistan and Sri Lanka between 1960 and 2020. The results are provided in two analytical tables: the first one will compare gender disparities in educational attainment and major economic indicators of the South Asian economies, and the second will synthesize the empirical estimates of the effects of gender equality in education on economic growth. The findings show that narrowing the gender gaps in education has a strong positive impact on economic growth and the female to male education ratio has a positive and strong relationship with the per capita income. The results indicate that South Asian nations where gender gaps have been reduced at a faster pace, including Bangladesh and Sri Lanka have had greater growth trajectories compared to countries where disparities are still prevalent. The article summarizes that to achieve a sustainable development in the region, specific investments in the education of girls, institutional changes to encourage their school attendance, and policies to translate educational benefits into labor markets are needed.

Keywords: Gender gap, education, economic development, South Asia, human capital, female schooling

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1. Introduction

South Asia is in a crucial crossroad of development. The region is home to approximately one quarter of the global population and has both some of the fastest growing economies and some of the most ailing gender inequalities in educational attainment. Although much has been achieved in the last 60 years, a lot still needs to be done between male and female education in a number of countries, mainly in rural places and among the less fortunate communities. The economic implications of such discrepancies have gained more urgency due to the growing need to exploit the demographic dividend and speed up sustainable development by policymakers.

The theoretical underpinnings of the gender equality in education and economic growth are based on the well established tenets in development economics. The human capital theory is the theory that education is used to increase the productivity of individuals and subsequently the national output. Economies lose a big chunk of their human capital stock when girls and women are systematically deprived of schooling. The endogenous growth theory also indicates that knowledge spillovers by educated workers can help maintain long-run growth without diminishing returns. These spillovers are cut short when half of the population is blocked to attaining education and growth potential is yet to be realized.

These theoretical forecasts have gradually been confirmed through empirical research. Gender inequality in education has consistently been found to lower economic growth in cross-country studies, and microeconomic evidence indicates that education by women yields high returns both privately and socially. The correlation between gender disparities in education and developmental outcomes is of specific relevance in South Asia in particular, as the region is characterized by a demographic population, labour market and cultural backgrounds.

There are three main research questions that are covered in this article:

1. What is the gender gap in education in the South Asian countries and what is the nature and how big is it?
2. What is the impact of gender inequality in education on the long-run economic development in the region?
3. Which policy initiatives have been effective in closing the gender gap and improving economic performance?

The rest of this paper continues in the following manner. Part 2 is a review of the theoretical and empirical literature on gender equality in education and economic growth. Section 3 displays the results of the analysis, with two tables which structure cross-country data and empirical results. The implications of the evidence on policy and practice are discussed in section 4. Section 5 concludes.

2. Literature Review

2.1 Theoretical Framework

Theoretical nexuses between female education and economic development work in a variety of ways. Schultz (1961) gave the principle ground on which investment on human capital is a productive economic option. This argument was then formalized by Becker (1964) who modeled education as an investment choice that returns in the future in terms of increased earnings and productivity. In the context of gender equality, this model means that limiting the access of women to education can result in inefficient resource distribution, and potentially productive potential is not used.

Galor and Weil (1996) developed a dynamic theory where the earning gap between sexes influences fertility choices and accumulation of human capital between generations. Within

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their model, women who earn more wages increase the opportunity cost of childbearing and result in lower fertility and increased investment in education of each child. This human capital accumulation and economic growth is a virtuous cycle created by this demographic transition. Lagerlolf (2003) followed up this analysis by showing that gender equality in education is likely to trigger long run growth because of its impacts on technological adoption and innovation. By availing education to women, the economy has a wide pool of skilled labor that can adapt and use emerging technologies.

Nelson and Phelps (1966) highlighted the part played by education in the diffusion of technology as opposed to invention. The ability to absorb foreign technology in developing nations that are below technological frontier is critically dependent on human capital stock. Gender disparities in education are an effective way of reducing the number of potential innovators and technology adopters by half, slows the rate of catch up development. All these theoretical contributions have formed the point of view that gender equality in education is not only a social goal but an economic necessity.

2.2 Empirical Results of Gender Equality and Growth

Empirical research on gender inequality and economic growth has developed significantly in the last thirty years. Initial research by Barro and Lee (1994) sparked controversy when it had a negative coefficient between female education and economic growth in cross-country regressions. Analysis however showed later that this was due to multicollinearity in the variables of male and female education, the effect of outlier observations and lack of regional controls. Lorgelly and Owen (1999) re-estimated the estimates of Barro and Lee and discovered that the negative coefficient on female education would turn statistically insignificant when the influential observations were omitted or the regional dummy variables were added. The same was demonstrated by Stokey (1994), who demonstrated that the negative apparently negative effect of female schooling had disappeared with an appropriate model specification.

The stronger empirical studies have indicated consistently that gender equality in education would favour economic growth. Dollar and Gatti (1999) studied panel data in 1975-1990 and found that female education was a positive forecast of growth in richer nations, but with high levels of collinearity. These methodological weaknesses were addressed by Klasen (2002) through longer periods of time, more feasible measures of education, and regional controls. Analysis of cross country data between 1960 and 1992 by him revealed that gender inequality in education had a strong negative impact on the rate of economic growth with the direct effect explaining between 60 and 60 percent of the total growth gap between regions. The paper approximated that gender disparities in schooling had cost South Asia and the Middle East and North Africa 0.9 percentage points of the yearly per capita growth.

Knowles, Lorgelly and Owen (2002) adopted a Solow framework to analyse the impact of male and female education on the economic development. Their findings showed that female education had a greater positive influence on growth as compared to male education and the coefficient of female schooling was statistically significant and economically meaningful. The authors have concluded that the educational gender gaps are a drag on the development of the economy, especially in those areas where the inequality is high.

Forbes (2000) revisited the issue of inequality and growth association by panel data and discovered that inequality variations such as gender inequality had a negative correlation with growth in the short- and medium-run. Her analysis implied the relationship between gender equality and growth to be strong to different model specifications and time.

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2.3 Return to Female Education

There is ample evidence that returns to female education are high and that they tend to be higher than those to males. When Psacharopoulos and Patrinos (2018) have performed a decennial survey of the world literature, they discovered that the private average worldwide payoff to one year of schooling is around 9 percent per annum. Notably, their analysis showed that women still have higher average returns to schooling than men and the female advantage is on the rise. This result is particularly important to South Asia, where the social returns to the education of girls can be even greater given the high gender gaps that exist.

Hill and King (1995) established that education of women can produce positive benefits that are not directly proportional to their earnings such as better health of children, low fertility and better household welfare. King and Hill (1993) summarized the evidence available in the developing nations and determined that educating girls offers one of the best returns of any development investment. This conclusion was reaffirmed by King, Klasen and Porter (2008) in their Copenhagen Consensus analysis where they listed gender equality in education as one of the most cost effective development interventions.

On the microeconomic level, educated women have high labor force participation, increased earnings and bargaining power in households. Voumik et al. (2023) analyzed 1990-2020 South Asian panel data, and identified female education as a significant and positive impact on employment of females in both the short and long-term. They found that trade openness and female education jointly produce good conditions under which women can participate in the labor market, and it is possible that education is a pivotal bridge between gender equality and economic empowerment.

2.4 South Asian Context

South Asia is a unique setting to analyse the education gender gap. The area has achieved a lot in bridging the gap between the two sexes in primary education, but there are still large gaps in secondary and tertiary school admissions especially in Afghanistan, Pakistan and some parts of India. Ali (2021) compared developing Asian countries during the period between 1970 and 2010 and discovered that an increase of 1 percent in the ratio of female to male education raised the GDP per capita in an average of 0.848 percent. The paper has identified Nepal and Pakistan as two countries where gender gaps are still acute, which may lead to significant growth dividends through specific interventions.

Duflo (2012) has surveyed the literature on women empowerment and economic development and postulated that the two are quite related but the interrelationships are too loose to be self-sustaining. Gender parity has to be initiated by continuous policy commitment towards equality as a goal in itself. This observation is especially true of South Asia, where institutional and cultural factors tend to hinder the process of economic progress into better educational results among girls.

A number of themes are evident in the literature review. To begin with, the theoretical argument in favor of female education as an engine of growth is strong and has many dimensions. Second, more cautious econometric studies have solved the early empirical controversies by confirming the positive effect of gender equality in education on its growth. Third, the payoff of education to females is great and in most cases higher than that of males. Fourth, South Asian nations that have less gender gaps have tended to have better economic performance. These results encourage the analysis synthesis in the next section.

3. Results

In this section, two analysis tables are provided, which categorize the evidence on gender disparities in education and economic development in South Asia. Table 1 presents a cross

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country comparison of educational attainment, gender parity indices and economic indicators of the chosen South Asian economies. Table 2 is a synthesis of the findings of major studies that explored the connection between gender equality in education and economic growth.

Table 1: ***Gender Gaps in Education and Economic Indicators in South Asia***

Country	Female Literacy Rate (%)	Male Literacy Rate (%)	Gender Parity Index (Secondary Enrollment)	GDP Per Capita (Constant 2015 US$)	Average Annual GDP Growth (%)
Bangladesh	71.5	76.3	1.12	1,961	5.8
India	70.3	84.7	1.04	6,461	6.0
Nepal	57.8	78.6	1.06	1,155	4.5
Pakistan	52.8	72.5	0.89	1,538	3.9
Sri Lanka	92.6	93.6	1.02	3,815	4.2

Note: Indicators of literacy rates and gender parity are approximated values between 2018 and 2020. GDP per capita and growth rates are averaged 2015-2019. Statistics based on World Development Indicators and UNESCO Institute of Statistics.

Table 1 shows that there is significant heterogeneity among the South Asian countries. Sri Lanka and Bangladesh show virtually gender equality in secondary enrolment with Bangladesh showing higher gender equality. Pakistan, in contrast, represents a great gender deficit with the female literacy being almost 20 percentage points lower than male literacy and the gender parity index being lower than 0.90. The economics data indicate that there is a relation between gender equality in education and economic performance because Bangladesh and India have made more progress in bridging gender gaps; these two countries are experiencing higher average growth rates compared to Pakistan.

Table 2: ***Summary of Empirical Studies on Gender Equality in Education and Economic Growth***

Study	Sample	Method	Key Finding
Dollar and Gatti (1999)	127 countries, 1975 to 1990	Panel regression	Female education positively associated with growth in richer countries
Klasen (2002)	109 countries, 1960 to 1992	Cross-sectional and panel regression	Gender inequality in education reduces growth by 0.9 percentage points annually in South Asia
Knowles, Lorgelly, and Owen (2002)	85 countries, 1960 to 1990	Solow growth framework	Female education exerts stronger positive effect on growth than male education
Forbes (2000)	45 countries, 1965 to 1995	Panel regression	Changes in gender inequality negatively related to growth
Ali (2021)	22 Asian countries, 1970 to 2010	Panel cointegration	1 percent increase in female to male education ratio raises GDP per capita by 0.848 percent
Voumik et al. (2023)	8 South Asian countries, 1990 to 2020	Panel ARDL	

Table 2 shows how empirical evidence has evolved over time with contentious beginnings to strong agreement. The original Barro and Lee (1994) conclusion of a negative correlation between female education and growth, was later to be demonstrated as a result of a

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methodological constraint as opposed to real economic implications. Subsequent research using more suitable specifications, extended time horizons, and regional controls all point to similar results: Gender equality in education fosters economic growth. These effects differ in magnitude in studies, but tend to suggest that bridging gender disparities in education produces significant economic payoffs.

4. Discussion

The evidence that has been synthesized in this article helps to draw some major conclusions related to the correlation between the level of gender equality in education and economic development in South Asia. First, the gender gap in education is a major limitation to economic growth in a number of nations including Pakistan and some regions of India. Second, the payoffs to female education are large and they are often higher than that of males and therefore investing in girls education is not only economically efficient but also a socially desirable activity. Third, those nations that have narrowed gender gaps faster, including Bangladesh and Sri Lanka have had stronger and more sustained growth patterns.

The ways in which female education impacts on economic development are complex. On the individual level, educated women are paid better and have a higher labor force participation. Voumik et al. (2023) established female education has a significant impact on female employment in the short and long-term in all South Asian countries. This channel of the labor market directly increases the aggregate output and household income. On the household level, educated mothers spend more on the health, nutrition and education of their children which generate intergenerational benefits that stack over time. Hill and King (1995) reported that education of women has a close relationship with low child mortality and high child health outcomes.

On the macroeconomic level, gender equality in education will increase the effective work force and boost the ability of the economy to adopt and innovate technologies. Theoretically, Lagerlöf (2003) demonstrated that gender equality can trigger the growth in the long term by expanding the pool of skilled labor that can adopt new technologies. The quality and inclusivity of human capital formation is an important competitive advantage to the South Asian nations that are aiming to climb up the value chain in manufacturing and services. Demographic transition channel as determined by Galor and Weil (1996) has a specific implication to South Asia. The problem of large numbers of young workers entering the labor market each year is a challenge to countries with large youth cohorts, including India and Pakistan. Female education promotes the demographic transition by increasing the opportunity cost of childbearing and investment in child quality. When it is accompanied by proper labor market policies and economic prospects, this shift can create a demographic dividend.

These dynamics are vividly represented in the comparison between Bangladesh and Pakistan. The development and gender inequality in both countries were similar in 1971 due to colonial and postcolonial backgrounds. In the next 50 years, Bangladesh followed vigorous investments in the education of girls, and the new initiatives aided by the innovative programs like female secondary school stipends and the growth of non-governmental organization service provision. All these investments have resulted in an impressive change where the number of females attending secondary schools has been more than males and the gender parity index is currently at 1.12. The average GDP growth of Bangladesh at 5.8 percent annually is far ahead of that of Pakistan (3.9 percent), and the nation has achieved a lot in terms of poverty and social indicators.

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Pakistan has on the other hand faced gender gaps in education that have been endemic. The literacy of women is still less than 53 percent and the gender parity index of secondary enrollment is 0.89 which means that out of every 100 boys attending school, only 89 girls are in secondary school. Such disparities are indicative of a complicated interaction between supply side limitations, such as poor school facilities in rural regions, lack of female teachers, and insufficient state spending on education, and demand side limitations, such as early marriage, cultural limits to female mobility, and the low opportunity cost of female time when there are limited labor market opportunities available to women.

The policy implications on this evidence are apparent. To begin with, the amount of money that is spent by the populace on education should rise significantly, with the special focus on the quality and access to schooling among girls. The UNESCO recommendation to equalize 4-6 percent of GDP to education is still applicable yet the way that the expenditure is distributed is as important as the amount. Specific barriers to girls attendance can be overcome through investments in female teachers, separate sanitation facilities and safe transportation.

Second, cash transfer programs and girls education stipends have shown to be effective in some settings and ought to be increased. The Bangladesh female secondary school assistance program showed that small financial stimuli can have a significant effect on the enrollment and completion rates. Education stipends and similar programmes in Pakistan, like the Benazir Income Support Programme, demonstrate potential but need to be expanded and better targeted.

Third, institutional changes aimed at encouraging female participation in the labor force will be able to increase the returns to education and boost the incentives of households to invest in the schooling of girls. Regulations of the labor market, childcare, and anti-discrimination can assist in converting educational benefits to economic empowerment. Fourth, the stability and growth per se of the macroeconomy makes the expansion of education possible by increasing the fiscal resources and improving household incomes. Nonetheless, it is not an automatic relationship as Duflo (2012) pointed out. Gender equality as a policy must be committed to continuously to make sure that growth is translated into better results between girls and women.

The weaknesses of the available evidence are to be taken into consideration. A large part of cross country literature is based on aggregate data of educational attainment which obscures significant variations in the quality of school provision, relevance of curriculum, and learning achievement. The gender parity index on enrollment, as helpful as it may be, fails to indicate whether boys and girls are getting education of the same quality. Recent findings in India indicate that the size of enrollment gaps has fallen by a significant margin but learning gaps still remain with girls in some states performing poorly on tests compared to boys despite having equal and similar attendance rates. Moreover, there is a difficulty in causally identifying the education effects on growth because of the possible endogeneity and omitted variable bias. Nations that invest in the education of girls can also work on other growth-promoting policies at the same time, and it can be challenging to separate the independent effect of gender equality. These identification problems can be tackled in future studies using instrumental variable methods and natural experiments, including the use of a phased implementation of education reforms.

5. Conclusion

This paper has discussed the connection between gender equality in education and long run economic development of South Asia. The empirical and theoretical evidence all state that

closing the gender gap in schooling contributes greatly to economic growth and development. The discussion shows that there is a significant level of heterogeneity among the South Asian nations as it can be seen that Bangladesh and Sri Lanka are making strides toward achieving rapid development in gender equality and that it is economically viable, whereas Pakistan and some regions of India are still struggling with inequalities.

The implications of the findings have significant policy implications. Girls education is among the most cost effective development interventions that have high returns, both in the private and social sense, and these returns are multiplied across generations. Nevertheless, to achieve such returns it needs a long-term political commitment, sufficient fiscal resources, and institutional changes to deal with the supply side and demand side obstacles to female schooling.

The gender gap in education is an important frontier as the South Asian countries strive to achieve sustainable development goals, poverty reduction, and speed up growth. Sealing this divide is not only socially just but a fundamental economic need that can open vast productive potential and lead to long-term growth. The data that this article provides, highlights the fact that the future economic wellbeing of South Asia is highly determined by how much the girls and women of this region are empowered by means of education.

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