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RESEARCH PAPER

Impact of Women's Education on Inclusive Growth: Insights from South Asia

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ABSTRACT

The paper aims at highlighting the importance of women's education to enhance inclusive growth. Inclusive growth, which ensures the equal opportunities available to all the segments of the society could not be achieved without making full participation of women into it. Female education is a key solution to many socioeconomic problems and consequentially achieving inclusive growth. In this regard to evaluate the impact of women's education on inclusive growth panel data models; the Fixed-Effect and the Random-Effect models have been applied. The present study selected the three most populous countries of South Asia; Bangladesh, India and Pakistan. The data relating to the inclusive growth model consists of 32 years from 1990 – 2021. The findings conclude the positive and significant impact of women's education on inclusive growth. Thus, it has been recommended that women should have greater access to education, it not only will help to raise the status of women in society but will make economic growth more inclusive by reducing gender gaps in education and consequently in other socioeconomic fields.

| **KEYWORDS** | Inclusive Growth, Robust Standard Error Estimates, Women's Education |

Introduction

Economic growth is all about shifting the production function upward primarily due to effective labour and physical capital improvements (Fatima & Khan, 2019) whereas, the concept of inclusive growth is more than just merely an increase in the volume of goods and services. Though there is no single commonly accepted definition of inclusive growth (Rauniyar & Kanbur, 2010). It has been explained by many researchers and international organizations. Inclusive growth includes the number of people at a vast level with no discrimination at all. It is simply labor-intensive growth. It aims at a poverty reduction strategy intending to benefit all the people in society. Inclusive growth works for disadvantaged groups and people in a society (Klasen, 2010).Women and the poor segments of society are the most disadvantageous group, particularly in developing countries. Women have to face gender discrimination at all levels; education, health, employment and politics (Khan et al., 2017). A country cannot achieve its goals relating to inclusive growth unless women are not properly engaged in it. Women, who constitute almost half of the world's total population could not be ignored while making an inclusive growth strategy for a country. Female education plays a central role in uplifting the status of women in society and breaking all the clutches in the way of development. Education raises the opportunity cost of woman's time. It decreases the total fertility rate and increases female labour force participation. Hence, female education affects economic growth directly and indirectly in both ways. Female education raises the economic status of women and increases the level of household income and decreases the level of poverty. Many social benefits are also associated with female education, as it improves the health status of women as well as

children. An educated woman also considers the importance of child schooling. Hence, educated women contribute to the economy through their productive and reproductive roles (Subbarao & Raney, 1995).

The countries of South Asia are quite perceptible concerning their population, economic structure and the challenges relating to development despite getting the status of developing countries (Kumar et al., 2016). South Asia is famous for inequalities in it, particularly the income inequalities are higher than in the richest countries of the world. There are huge disparities in the education sector also (Munir & Kanwal, 2020). Higher female education has changed women's lives dramatically around the world. Female labour force participation has increased due to an expansion in female education but in South Asia female labour force participation has decreased. These are the gender social norms in South Asia that keep women behind in the way of development (Klasen, 2019).

The gender parity index of South Asia is about 62.4% showing the lowest performance of South Asia in the field of gender equity among all the other regions of the world. South Asian women contribute only 23.6% of the total labour force of the region. The main reason women lacking women behind in almost every field is the lack of access to higher education (Rashid & Sarwar, 2022).

Women can participate in the economy to their full potential by acquiring knowledge and skills which are closely associated with the attainment of education. Women's access to education at all the levels not only increases their labour force participation but also has many non-economic benefits as discussed in the introduction of the study. A more educated woman plays an active role in the economy by directly joining the labour force market and indirectly by reducing the fertility rate and hence increasing the per capita income. Women with proper education become active participants in economic growth activity rather than just passive characters.

Literature Review

Education plays an important role in the development of a nation. In developing countries, primary and tertiary education has played a significant role in economic growth. India and Sri Lanka have emphasized primary education in developing the nation (Ali et al., 2021). There exists a long-run relationship between the economic growth of a country and higher education (Chaudhary et al., 2009). Gender inequality impacts negatively the economic growth of a country, particularly in the educational sector. Gender inequalities if are reduced in education attainment, the employment sector will flourish ultimately by raising female labour force participation (Pervaiz et al., 2011). Countries by reducing gender inequalities in the education sector become able to raise their human capital and reduce income inequalities ultimately (Chani et al., 2014) whereas, human capital combines a combination of natural capabilities, knowledge and skills. Female human capital contributes to economic growth more effectively through their dual role; economic and non-economic role (Khan, 2016).

Bangladesh which falls among the poorest nations around the world has remarkably declined its total fertility rate in the last forty years. Female education is a highly contributing factor among all other socioeconomic factors. Increased levels of education come negatively associated with family size (Bora et al., 2023). Education of women is positively correlated with antenatal care of women. The wealth index and the decision-making role of women also help women decide on their health and particularly reproductive health care services. Educated women were found more focused towards antenatal care and ultimately on skilled birth pregnancies (Bhowmik et al., 2019). Female education also raises the well-being of the household as well as of society. It has been observed that with higher female education the child mortality rate has decreased. It consequently controls the fertility rate (Qasim et al., 2016). In OECD countries the investment in female education

raised the female labour force participation rate and hence decreased the total fertility rate. The female population converted to female human capital by acquiring higher education (Law & Wye, 2023). Female education is considered one of the socioeconomic reforms adopted for the adolescent fertility rate (Braverman-Bronstein et al., 2023). Education generally impacts the level of productivity irrespective of gender. But in the case of women education also produce positive externalities in the form of socioeconomic benefits. It not only raises female labour force participation but also reduces the gender gap in the labour force market. Female labour force participation then contributes to reducing poverty. Hence, promoting female education promotes inclusive growth (Hong et al., 2019). Women's access to the fields of science and technology will develop skills in women and make them able to enter the high-income generating fields. This will not only help women to be paid higher earnings but also will bring about economic gender parity (Sharma, 2023). Economic growth raises job opportunities in the economy. If women's education is to be promoted in the same way then women better avail these opportunities in the formal markets (Su et al., 2019). A study in the UK based on micro-data from Labour Force Survey concluded that ethnical and gender differences were to be found. The wage gaps in labour force market were not only between men and women but among women also. Education was found one of the compositional factors like an individual's age and the nature of their job. The wage gaps were higher for the higher level of jobs designed with high education and skilled workers (Amadxarif et al., 2020).

There is vast literature showing the importance of female education, present study has focused few prominent studies here to relate our study with the existing literature. It has been observed that as far as we have investigated, not a single study has captured the impact of women's education on inclusive growth in this way. The present study has used a composite index of inclusive growth including its economic dimension relation to the GDP growth rate, health and environment dimension, the living standard dimension relating to life expectancy at birth rate and literacy rate in general, human capital dimension relating to government expenditures on health and education and governance dimension relating to government effectiveness and control of corruption. The study in hand has explored the impact of women's education on a well-defined concept of inclusive growth that covers almost all aspects of society. Hence, the present study will contribute to the existing literature.

Theoretical Framework

The human capital theory provides the theoretical framework for this study. The theory of human capital talks about the education and skills that not raise the productivity of the workers but also raise their future incomes (Becker, 2009). The theory puts forward that making expenditures on education is just like an investment where we face some costs but in return the principal amount and benefits are manifold. Hence, the consumers in the education market are considered as capitalists and education is like an investment in human beings (Galor & Moav, 2006). The human capital theory is more relevant to the world's more populous countries mentioned here in our study; India, Pakistan and Bangladesh which fall among the top ten world's most populous countries. Human resources could be converted to human capital through proper education and reap this fruit in the form of the increased economic growth rate of the country. Therefore, the availability of good quality education and also access to it is crucial for converting human resources into human capital (Klugman, 2011).

According to the Asian Development Bank (ADB), economic growth is considered as inclusive only if all the parts of the society are engaged in it to reap the benefits of new opportunities (Ali & Son, 2007). Furthermore, economic growth is appraised to be inclusive by the OECD as it spreads the monetary as well as non-monetary benefits to society (Co-operation & Development, 2014). Our study Considers the prominent definitions of

inclusive growth to build an index of inclusive growth, as Rauniyar and Kanbur (2010) are of the view that inclusive growth has no single definition accepted as common.

Material and Methods

The present study aims to evaluate the impact of women's education on the inclusive economic growth of selected three most populous counties of South Asia; India, Pakistan and Bangladesh. The data consisted of 31 years from 1990 – 2021. Since it is longitudinal data, therefore, we have applied the econometric techniques best suited for panel data. The most common panel data models are the fixed-effect models and the random-effect models. These estimating techniques are used to control the tendency of ε_{it} to greater as compared to some individual units (individual effects) and might be expanded over some periods (time effects). In this regard, the fixed-effect model keeps a unique intercept for each country or unit. It allows intercept to change concerning individual units but it is unchangeable concerning time.

$$y_{it} = \beta X_{it} + \alpha_i + \varepsilon_{it}$$
(1)

The random disturbance term, ε_{it} is used in random-effect models. The random disturbance term is distributed independently across the countries with the time mean taken as zero and variance as constant, σ_ε^2. The random-effect model estimates the intercepts of countries or individual units using the variance, σ_ε^2 and mean distribution, μ.

$$y_{it} = \mu + \beta X_{it} + \alpha_i + \varepsilon_{it}$$
(2)

In the above equation of the random-effect model, α_i is time-invariant ε_{it} is the disturbance term which is uncorrelated over time.

Further, the Hausman test has been applied to select the better model between the fixed effect and the random effect. Since the panel data consists of long periods; hence, there are chances for cross-sectional dependence, heteroscedasticity and serial correlation. Therefore, different diagnostic tests have also been applied to the data set. For cross-sectional dependence, the Pesaran's test has been applied whereas, the Wooldridge test has been used to detect serial correlation in data and the Wald test is used to check heteroscedasticity.

The study will use the following inclusive growth model to fulfil its objectives.

$$IG_{it} = \beta_0 + \beta_1 WEDU_{it} + \beta_2 POPgr_{it} + \beta_3 TOT_{it} + \beta_4 INF_{it} + \beta_5 FDI_{it} + \varepsilon_{it}$$
(3)

Note that in the above-mentioned equation;

IG = Inclusive Growth is a weighted composite index where weights are assigned through the Principal Component Analysis, stated below;

  i.   Economic dimension: annual GDP growth rate (Source: WDI)

 ii.   Health and environment dimension: access to fuel and technology, access to clean water and sanitation and, daily caloric supply. (Source: WDI)

iii.   Living standard dimension: life expectancy at birth rate and literacy rate. (Source: WDI)

iv.   Human capital: Govt. expenditure on health and govt. expenditure on education. (Source: WDI)

v.   Governance: government effectiveness and control of corruption (Source: WDI)

POPGR = Population Growth Rate: the growth rate of the population calculated annually. (Source: WDI)

TOT = Terms of Trade: the ratio of the value of export to the import. (Source: WDI)

INF = Inflation: calculated by consumer price index annually. (Source: WDI)

FDI = Foreign Direct Investment: Foreign direct investment, net inflows calculated as a percentage of GDP. (Source: WDI)

WEDU = Women's Education: an index of the following;

i.   Primary education of women: Female Gross enrollment ratio in primary education is the ratio of total enrollment. (Source: WDI)

ii.   Secondary education: Female Gross enrollment ratio in secondary education is the ratio of total enrollment. (Source: WDI)

iii.   Tertiary Education: Female Gross enrollment ratio in tertiary education is the ratio of total enrollment. (Source: WDI)

iv. β_0 = Intercept, i = Cross Sectional Unitsβ, T = Time point t, ε_{it} Error Term, and β₁, β₂, β₃, β₄ and β₅ are regression coefficients.

∴ WDI = World Development Indicators by World Bank

The normalized data has been used to construct the index of Women's Education and the index of Inclusive Growth. After normalizing the data, there was a need to assign weights to the variables relating to each dimension. To assign weights to the variables relating to the different dimensions of the inclusive growth index, we have applied the Principal Component Analysis (PCA). As stated by Mitra and Das (2018) PCA principal components are used which are linearly uncorrelated and these components usually summarize the mutually correlated variables. First, orthogonal components are decided based on the number of variables. We have tried to obtain many variations across the countries using a minimum number of components. Kaiser's criterion has been used in this regard which suggests only those components whose values are greater than 1. Further, to check sampling adequacy, the Kaiser-Meyer-Olkin (KMO) has been used. The indices calculated relating to each dimension of the composite index then, all these dimensions are combined and assigned equal weights 1/5 to build a composite index of inclusive growth. Same method has been applied to construct the index of women's education.

Results and Discussion

Since our study is based on longitudinal data from three South Asian countries then, the panel data models have been used to evaluate the impact of women's education on inclusive growth. In Table 1, the results of the fixed-effect and the random-effect models are shown. The descriptive statistics of all the variables used in the construction of the women's education index and inclusive growth index have been presented in the following Table 1.

Table 1

Descriptive Statistics: Women's Education, Inclusive growth and independent variables

	Variable	Obs.	Mean	Std.Dev	Min	Max
Education	PRIMEDU	96	88.15958	20.61465	40.44	124.99
	SECEDU	96	44.07604	19.06598	12.81	86.27
	TEREDU	96	9.164479	8.094853	.89	32.57
	GDPGR	96	5.194063	2.286968	-6.6	8.85
Inclusive Growth	ACFT	96	25.46667	15.35237	5.5	71.9
	ACWSANT	96	34.38146	20.31039	-10.78	74.2
	LFEXP	96	64.7551	4.10786	54.15	72.81
	LIT	96	54.47127	10.93834	41.63802	83.47614
	CALLORIC	96	2373.729	127.5832	2003	2566
	GEXPHLTH	96	2.830972	.3615661	2.102281	3.57256
	GEXPEDU	96	2.627928	.3840651	1.99621	3.57256
	GEFTNS	96	-.4894884	.3655981	-1.280414	.4055133
	CNTCR	96	-.8561826	.3746612	-1.637376	-.2058443
Other variables	POPgr	96	1.780914	.5891013	.7972161	3.297471
	TOT	96	87.00167	23.86289	46.27625	136.0465
	INF	96	7.241739	3.287211	2.007174	20.28612
	FDI	96	7.16e+09	1.39e+10	1390444	6.44e+10

The number of observations of each variable along with its minimum, maximum, mean value and standard deviation is provided is provided in Table 1.

Diagnostic tests

Table 2 consists of the diagnostic tests. These diagnostic tests have been applied to check the accuracy of the interpretations of the models of inclusive growth. In this regard, the cross-sectional dependence test, test for serial correlation and heteroscedasticity have been applied to these models.

Table 2
Diagnostic tests

Pesaran's test of cross-sectional independence						Wooldridge test for autocorrelation	Modified Wald test for group-wise heteroscedasticity
WEDU	POPgr	INF	TOT	FDI	IG		
9.28*	8.33*	4.12*	6.23*	4.42*	9.54*	6.157 (0.1312)	7.62 (0.0545)
0.000	0.000	0.000	0.000	0.000	0.000		

Note: * indicates significance at the 1% level. The probability values are shown in square brackets

Prsaran test has been applied to check the cross-sectional dependence. The null hypothesis of no cross-sectional dependence has been rejected as the p-values are less than 5 per cent and we can say that there exists cross-sectional dependence with 1 per cent level of significance. Further, the Wooldridge test is applied to detect the serial correlation in panel data. The null hypothesis is rejected, as F-statistics is insignificant. Furthermore, the modified Wald test is applied to check the group-wise heteroskedasticity in the data set which also confirms the absence of heteroscedasticity. These diagnostic tests have proved that model is good to predict the results.

The Inclusive Growth Model

The inferences drawn from the panel data models; the fixed-effect models and the random-effect models are mentioned in Table 3. Further, the impact of the factors affecting inclusive growth has also been discussed.

In Table 3 the model of inclusive growth with women's education index as its important factor along with some other factors. We are intended to interpret the result of the inclusive growth model with fixed-effect as Husman test has proved it the better model than the random-effect model but, the results of Pesaran CD test in Table. 2 has proved the cross-sectional dependence in the data set. Hence, the fixed-effect model has been re-estimated with Robust Standard Error Estimators to get authentic results as shown in Table. 3.

Table 3
Inclusive Growth Model

Variables	WEDU	POPgr	TOT	INF	FDI	CON	No. of obs.	R2*	R2**	R2***	Hausman test
FEM	.692*** (.0462)	-.124*** (.0191)	.023* (.0130)	-.029** (.0137)	.028** (.0132)	.223*** (.0312)	96	0.95	0.36	0.78	184.84*** (0.000)
REM	.383 *** (.0445)	-.177*** (.0276)	-.025 (.0228)	-.105*** (.0230)	.037 (.0239)	.439*** (.0298)	96	0.91	0.46	0.85	------------
FERSE	0.692*** (0.063)	-0.124*** (0.020)	0.023 (0.017)	-0.029* (0.019)	0.028* (0.014)	0.223** *(0.040)	96	R2 0.96	Adj. R2.95	------	F-test 272.74*** (0.000)

Note: FEM is short form of 'Fixed-Effect Model, REM is indicating Random-Effect Model whereas, FERSE stands for Fixed Effect with Robust Standard Error Estimators. R2*, R2**, and R2*** are showing R2 within, R2 between and, R2 overall respectively

* indicates significance at the 10% level, ** indicates significance at the 5% level, and *** indicates significance at the 1% level. The estimated standard error values are mentioned in the parentheses below the coefficient values

We see that women's education has a strong positive impact on inclusive growth. Women's education when increased by 1 per cent, increases inclusive growth by 69 per cent. Women's education (WEDU) in the second regression has a positive and statistically significant effect on inclusive growth. The results are quite expected. Women's education promotes gender equality not only in the field of education but also in the labour market. Education is considered a key factor to make women economically empowered. Women with higher education have more opportunities to work in formal markets with paid jobs. A lack of education or primary education is considered one of the main reasons to keep women stuck in the agriculture sector and the informal labour markets. Women with education become able to know about their reproductive rights and the use of contraceptive tools. Thus, women's education in multiple ways, directly as well as indirectly positively affects inclusive growth. The result of women's education supports (Alekhina & Ganelli, 2023; Baqai & Mehreen, 2020; Ferrant & Thim, 2019; Hong et al., 2019; Jha, 2014; Khan et al., 2020; Kopnina, 2020; Maggi & Tang, 2022; Patel, 2011; Walker et al., 2019).

Population growth rate (POPgr) in the model has a negative and statistically significant effect on inclusive growth. We observe that when the population grow by 1 per cent increases, it decreases inclusive growth by 12 per cent. The result is quite expected. Population growth rates are negatively associated with economic growth. As the population growth rate decreases the per-capita income. Economic growth results can be offset due to the high population growth rate in developing countries especially, as the country's demand for food and availability of necessities increases with manifolds. As Malthus assumes that unchecked population growth badly affects the economy and economic development. The negative correlation between population growth and inclusive growth by incorporating economic and social into it is also been highlighted by eminent studies in the past (Bucci, 2023; Bucci et al., 2021; Chowdhury & Hossain, 2018; Gil-Alana et al., 2022; Sebikabu et al.,

2020). As the terms of trade (TOT) turn better with 1 per cent it significantly increases the inclusive growth by 2 per cent. With better terms of trade, the trade earnings become more than the trade billings. This result is quite following (Elsenhans, 2021; Vianna & Mollick, 2021). Inflation (INF) also has a strong negative impact on inclusive growth. As inflation increases by 1 per cent it decreases the inclusive growth by 3 per cent. Inflation usually negatively impacts economic growth. With an increase in the general price level, consumption activities are affected adversely. The result is also highlighted by (Tenzin, 2019; Uddin & Rahman, 2023). Foreign direct investment (FDI) in the model of inclusive growth has a strong positive impact on inclusive growth. As foreign direct investment increases by 1 per cent, it increases the inclusive growth by 3 per cent. Foreign direct investment boosts economic growth as it raises government expenditures on developmental projects with also boosts employment opportunities in the economy. The result is also endorsed by (Dinh et al., 2019; Wu et al., 2020). The constant term of the model has a strong positive impact on inclusive growth. In the model, 95 per cent of the variation in the inclusive growth within the countries is captured. In this model, 36 per cent variation in the inclusive growth between the countries has been captured whereas, 78 per cent overall variations in the inclusive growth have been captured in the model. Moreover, the Hausman test shows a p-value of less than 5 per cent and making the fixed-effect model better than the random-effect model.

Conclusion

The study used a composite index of women's education by aggregating primary education, secondary education and tertiary education, to evaluate the impact of women's education on inclusive growth of selected South Asian countries. It has been observed that women's education has a strong and positive impact on inclusive growth. Women around the world constitute a large portion of the total population. This large portion of the population if properly engaged in the economic growth process, will incorporate the benefits to the economy as well to the society in a dual way. Educated women better utilize their reproductive rights and help the economy by controlling the population, and also show their productive role by joining labour force participation.

The study recommended a strong role of the government to raise female education. The female enrollment rate in higher education should be increased, and the female enrollment rate in tertiary education is indispensable to compete with the challenges relating to the formal labour force market faced by women. Female education will help to lower gender disparities in society as well as in the economy. Higher education of women will help to break down the gender stereotype culture in society. Developing countries like Bangladesh, India and Pakistan which have high population growth rates, should have a strong emphasis on women's education. An increase in female education will help these countries in the manifold.

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