

RESEARCH ARTICLE

Prevailing Poverty in SAARC Countries: Can Education Help?

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Abstract: South Asia is a highly populated and poverty-ridden region of the world that barely spends 0.9% of its GDP on education. This present study is structured to capture the variable returns in various types of education on poverty for the selected SAARC economies for the period ranges from 1983 to 2016. This study applies the fully modified ordinary least square (FMOLS) approach to obtain empirical results of the Kuznets curve of education poverty. The empirical results reveal that the primary enrollment increases poverty and does not follow a Kuznets curve. In contrast, an initial increase in secondary enrollment increases poverty but later leads to a decrease in poverty. Finally, an initial increase in tertiary enrollment decreases poverty but later leads to an increase in poverty. Based on these findings, this study proposes that education policy should be formulated separately for each level of education to extract maximum gains for the workforce.

Keywords: education enrollment, social exclusion, Kuznets curve, panel FMOLS

Poverty is a curse that forces sacrificing needs and wants and pushes people to become selfish economic agents. Prophet Muhamad (PBUH) sought refuge with Allah from poverty (Sunan an-Nasa'i, 2006; Hadith no. 5461) as it leads to disbelief (Sunan an-Nasa'i, 2006; Hadith no 1347, 5485) and social unrest in the society. The inability of humans to avail opportunities and choices, which ultimately damage their self-esteem, is called poverty. This shows that individuals are incompetent to play their productive role in any society; thus, they are socially excluded. Furthermore, it discloses a sense of uncertainty, helplessness, and deprivation from resources among the masses. A situation in which people deprive of prosperity is defined as poverty, and it carries various dimensions. It consists of the scarcity of income and the inability to acquire basic needs in the form of goods and services,

which are required for one's survival along with maintaining self-esteem. Moreover, when any state is unable to maintain the wellbeing of the public in the form of providing access to opportunities of health and education, clean drinking water, and voice and accountability, then it is facing the problem of poverty.

The World Bank (2000) described "poverty is starvation. Poverty is a deficiency of housing. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having work, it is anxiety for the future, living one day at a time" (p. 15). Hence it can be concluded that poverty is when your resources are well beneath your minimum requirements (United Nations Industrial Development Organization, 2003). Poverty can be defined as the incapacity to afford a satisfactory level of consumption. This satisfactory

level of consumption is defined as the bare minimum in the former, and as an average in the latter (Black, 2003). Poverty reduction has been an essential goal of progress strategies in most modern societies. This is also on the agenda of numerous universal development organizations, including the UNDP, the World Bank, and UNICEF.

The reasons for poverty are the elements that shrink the resources or raise constraints and expenses that hinder access to resources. The most probable reasons for poverty today are unemployment and low-paying jobs; low levels of education; high cost of housing and fundamental products and services; discrimination against individuals because of their class, ethnicity, incapacity, age, sexuality, religion, or parental status that can keep individuals from getting away from poverty through high qualifications or occupations and can confine access to jobs. A youngster who does not get concerned and healthy child-rearing can be at higher risk of being poor in future life. This affects the development of education, social, and emotional abilities. Poverty leads to some consequences like health problems, economic downturn, being a victim or perpetrator of the crime (Hassan et al., 2016; Anwar et al., 2017; Arshed et al., 2019b), lower educational achievement (Arshed et al., 2020), low pay in adulthood, and lower savings in later life. There are various factors or economic and non-economic actors that affect poverty. However, in this study, we will attempt to find the effect of social factors like the incidence of education enrollment on poverty to see what size of education can help in eradicating poverty in SAARC.

A process whereby people explore information, obtain knowledge, and gain skills is represented as education. In other words, the transfer of information and skills in a systematic and organized manner from one age group to another age group followed by a standardized syllabus is called formal education. The formal education process ranges from primary education to tertiary education or above, where people start learning from foundation to experts of the field. Someone more skillful and more educated will eventually acquire more opportunities for earning livelihood and vice versa. This also implies that the income level of the more skilled or more educated people will remain higher in contrast with the income level of the nontechnical, unskilled, or less educated people. This concludes that education may create a

difference in the income level of the people (Janjua & Kamal, 2011; Munir & Kanwal, 2020).

Among many other macroeconomic factors, education is an important factor that could be used as a source of poverty alleviation in the country both at micro and macro levels. As far as micro-level is concerned, uneducated people have lower productivity, translating to low incomes and low living standards. On the macro-level perspective, when illiteracy is widespread, then the pace of making economic progress slows down. We observe the fall in the overall productivity of the economy, fall in per capita income, and depreciation in the standard of living (Tilak, 1999, 2002; Carm et al., 2003). Education alone is an important actor and gateway to enjoy economic development and poverty reduction in any economy (World Bank, 1999).

Furthermore, there are various approaches to overcome poverty, that is, direct and indirect approaches. The direct approach comprises of equal distribution of resources, like food stamps and employment. In contrast, the indirect approach contains the provision of transport facilities to the public, improved health and education facilities, and other public services. This allows people to increase their livelihood, which enables them to save more and allow them to manage themselves to come out from the poverty trap. Besides this, when the state takes measures to encourage tertiary enrollment, then this will increase the supply of highly educated and technical workers in the workforce. It will help in boosting the country's pace of producing goods and services. Hence, it will be a source of an engine of growth in a country (Hanif & Arshed, 2016).

Many researchers explored the relationship between education or human capital and economic growth. Their argument is constituted using endogenous growth theory as discussed by a variety of researches like (Barro, 1991, 1996; Aghion & Howitt, 1992; Mankiw et al., 1992; Aghion et al., 1999; Bils & Klenow, 2000; Hanushek & Kimko, 2000; Hanif & Arshed, 2016). The channel discussed above also helps in cutting down poverty from the country as supported by Tendulkar and Jain (1995), Ravallion and Datt (1996), Tendulkar (1998), Bhagwati (2001), Deaton and Dreze (2001), Datt and Ravallion, 2002; Dollar & Kraay, 2002; Agarwal, 2007).

Investment in human capital to enjoy high economic growth and reduced poverty argument became famous

during the mid-1990s in Asia. The facts disclose that countries of East Asia, such as South Korea, Hong Kong, Taiwan, and Singapore, were making progress in their respective economies in the 1970s and 1980s. This is because they were investing in humans to transform them into intellectuals who could perform research to explore cost-effective production methods to elevate economic growth and curtail poverty. This argument motivates the study to find out the number of countries in which data supports this argument and to see whether the route from education to poverty reduction is observable or not. If yes, then in how many years this economy may reduce poverty from the country by investing all its resources in education.

The investment in the education system has led to the advancement of nations. So, it can be said that education is a multi-pronged process that plays an essential part in improving the economic development of the nation. Education generally decreases income differences between the rich and the poor (Arshed et al., 2018). Efforts to spread human capital are compulsory to enhance standards of living. As far as macro-level is concerned, we may see that countries with low incomes spend less on the education of their masses. Hence literacy rate remains low in such countries (Todaro & Smith, 2015). The low literacy rate does not allow people to earn high incomes, and hence, this exhibits the poverty trap.

From a micro-level perspective, the poor do not send their young ones to the schools. Hence, it concludes that it is the misery of the people that results in the illiteracy of their young ones. The conclusion is the same in both perspectives. However, the important thing is that the way out to break the shackles of the vicious circle of poverty is to rescue the nations from both micro and macro-level perspectives. The present study proposes an argument adapted from the Kuznets curve, whereby an increase in human capital at a low incidence of human capital has a different effect than an increase in human capital at a higher incidence of human capital. The education-poverty Kuznets curve states that if people start investing in the education of their young ones, it will help them earn higher incomes. Hence it will enable to access all the required needs. However, whether that individual is moved out of poverty, the outcome still depends on the total stock of education enrollment (see income inequality from Arshed et al., 2018, 2019a). As the effect of education may depend on its incidence, this requires

the assessment of variable returns to scale of education enrollment for the case of SAARC countries. This study will further estimate the net effect of primary, secondary, and tertiary enrollment on poverty, in each country, based on a comparison of actual enrollment with the incidence. Based on these segregated effects of all levels of education on poverty, this pursuit will conclude that among all the education levels, which level is more helpful in controlling poverty in the selected countries.

According to the World Bank (2018a) report, the extreme poverty of \$1.90 a day at the global level has reduced from 36% in 1990 to 10% in 2015. This has moved about a billion people out of poverty. However, there is growing concern that the sustainable development goal of ending poverty by 2030 is at risk. Mostly, the conflict-prone countries like Pakistan and India are stuck at high incidence of poverty. While exploring the SAARC economies, they are the epicenter of conflict and poverty-ridden region. SAARC is only second to Sub-Saharan Africa in terms of the number of impoverished people (World Bank, 2018a). Forty percent of all Afghan children have experienced stunted growth (World Bank, 2018b). At the same time, India is second to China in terms of the inability to access the financial market (World Bank, 2018c). The lack of education is causing 98% of people in Nepal and 68% of people in Pakistan to accept informal employment without any long-term facilities (Georgieva, 2018). There are about 60 million people who live in landfills and dumpsites or working as waste pickers in order to have subsistence living (Kaza & Yao, 2018). These regions are located in Sri Lanka and India from South Asia. Finally, the South Asia region barely spends 0.9% of its GDP, compared to 2.25% of Europe and 1.5% of Africa, on safety net programs (Gladieu, 2018). These highlights of the South Asia region motivated the authors to study the determinants of poverty in this region.

Previous studies used a linear form of education enrollment. This specification checks the effect of the current scenario, assuming constant returns to scale but failed to incorporate the size (variable return to scale) effect of education enrollment using the quadratic function. This study used the Kuznets curve approach (Kuznets, 1956) to assess the diminishing returns on education by incorporating the non-linear function of education enrollment (Crenshaw & Ameen, 1994; Arshed et al., 2017c, 2019a) on poverty for SAARC

countries between 1983 to 2016. The advantage of a non-linear form is that it allows for the effects to be determined by the incidence of the independent variables. Hence, policymakers can optimize their policy to target poverty alleviation.

The rest of the study is structured as follows: section two discussed the literature review, putting greater emphasis on the relationship between educational enrollment and poverty. The third section describes the data, the construction of variables, the empirical regression model, and the appropriate estimation methods are discussed. The fourth section is devoted to discussing the regression results. Section five concludes the significant findings along with policy recommendations.

Literature Review

Impact of Education on Poverty

According to the World Bank (1999) report, educational attainment goes hand in hand with poverty. With large gaps in literacy and enrolment rates present, several regions are widening the gap between the poor and the non-poor, and steepening the income distribution (Arshed et al., 2017c). According to Poverty Reduction Strategic Plans (PRSPs), education empirically played a key role in poverty reduction. The schooling system must produce more and more skilled and literate population who can contribute to development. Generally increase in the population dissipates the available resources related to education and health (Mamoon et al., 2015) but by focusing on education helps by increasing the productivity of the labor services offered and extending it to the poor. Merely going to school for a minimum period of years is insufficient in itself to get people out of poverty (Carm et al., 2003). Another step is to ensure relevant skills, which may increase their employability or chances of becoming an entrepreneur.

Barro and Lee (1993), in their panel data study comprising of 129 countries, examined the role of education on economic growth. Results showed that education levels have a strong potential of reducing poverty because education shows direct positive effects on growth rates. Becker (1995) examined the effect of education on poverty reduction by utilizing the data of selected Asian countries. Results showed that elementary, secondary, and higher education are of great importance in poverty alleviation. Ravallion

and Datt (1996) studied the impact of the growth of the different levels of education on poverty in India. Results showed that the growth of primary and tertiary education has contributed to a reduction in poverty. Similarly, Harper et al. (2003) explored the theoretical determinants of the poverty alleviation process; they highlighted the significance of education as a means of poverty reduction.

Verner (2004) studied the case of Paraiba and northeast Brazil and concluded that educational attainment has a significant role to play as a poverty-reducing factor. Education of any level or skill is significantly and negatively associated with poverty. Psacharopoulos and Patrinos (2004) conducted a study to examine the returns of education in terms of reducing poverty. According to them, returns to primary schooling on the poverty alleviation process tend to be higher than returns to secondary and tertiary education. It provides essential awareness and skills for the labor market. Self and Grabowski (2004) explored different educational levels and their impact on income in India. They showed that primary education has a causal impact on income growth. In contrast, secondary education has a comparatively limited impact on income growth. Colclough and Arif (2005) studied the impact of educational returns on poverty alleviation, which concluded that the returns of primary education are much higher as compared to that of tertiary education. Tilak (2007) iterated that post-elementary education is important for the reduction of poverty in India. Contrary to this, Hanif and Arshed (2016) showed that, for SAARC countries, primary education has a negative effect on growth, whereas secondary and tertiary education has a positive effect. This is because an individual with primary education inherits creativity, which can lead to innovation.

Janjua and Kamal (2011) used the panel dataset sample of 40 countries from 1999 to 2007 and utilized fixed and random effect techniques. Results of the study showed that secondary education emerged as the main contributor to poverty alleviation. But, in the case of Pakistan, secondary education is positively and significantly related to poverty.

Pervez (2014), in a time-series study of Pakistan, found that literacy rate and secondary education have a negative and significant impact on poverty. Similarly, Thapa (2015) studied Nepal, and results showed that there is a negative relationship between literacy rate and poverty.

Talukdar (2012) constituted the panel dataset comprised of 115 developing countries over the period 1981 to 2008, where the findings showed that secondary education is negatively and significantly related to poverty. Similarly, Afzal et al. (2012) analyzed the relationship between education, poverty, and economic growth in Pakistan from 1971 to 2009. ARDL results showed that better education could be a useful tool for reducing poverty and enhancing economic growth in Pakistan. Finally, a study by Arshed, Alamgir et al. (2017), using labor force survey data of Pakistan, showed that tertiary education has higher poverty alleviation potential than secondary education. Deyshrappria (2018) assessed 119 countries to assess the role of globalization on poverty, which confirmed that an increase in secondary education has a poverty eradication effect.

Impact of Education Expenditure on Poverty

Recent evidence from growth theories points out that education is crucial for achieving sustainable economic development through investment in human capital (Mankiw et al., 1992; Aghion & Howitt, 1992; Aghion et al., 1999). Ijaiya (1998) investigated the impact of investing in education as a necessary recipe for alleviating poverty in Nigeria. Results showed that investment in education increased GNP per capita and reduced poverty. Fan et al. (2000) studied the channels of the effect of different types of government expenditure on poverty and productivity growth in India. Using data from 1970–1993 and a simultaneous equations model was developed. Results showed that public expenditure on education has the highest degree of poverty reduction capacity. Zaman et al. (2011) explored the growth and spending impact on income inequality and poverty for a panel of five selected SAARC countries from 1988 to 2009. The results of the POLS method revealed that public spending on education has a positive impact on the poverty alleviation process.

Simon-oke (2014) investigated the relationship between human capital formation, physical capital formation, and poverty reduction in Nigeria, using data from 1978 and 2008. Results showed that government investment in education has not helped to reduce poverty in Nigeria. Hidalgo-Hidalgo and Iturbe-Ormaetxe (2014) hypothesized that the public expenditure in education affects poverty reduction. To test this, they utilized the cross-section data of

17 European countries. Results showed that public expenditure on education and poverty is negatively and significantly related. Hassan et al. (2020) assessed the role of education expenditures on poverty for the case of 73 developing countries. The results showed that while controlling for each type of institutional quality, there is a negative effect of education expenditures on poverty.

Impact of Economic Growth on Poverty

Roemer and Gugerty (1997) claimed that economic activity measured in terms of economic growth tends to reduce poverty. Zaman et al. (2011) used the pooled least square method, which revealed a significant and negative association between poverty and economic growth. Afzal et al. (2012) confirmed that in both the short-run and long-run, poverty and economic growth are inversely and significantly related. Opposing this, Hidalgo-Hidalgo and Iturbe-Ormaetxe (2014) studied 17 European countries to confirm the positive effect of economic growth and poverty. The theoretical connection between economic growth and poverty can be assessed from the Kuznets (1956) hypothesis whereby low levels of growth creates income disparity while further increase in growth may initial trickle-down effect.

Impact of Inflation on Poverty

Inflation is commonly known as the rise in the general level of prices of goods and services in an economy over a period of time. Out of the major demerits of inflation, the most concerning fact is that it decreases the purchasing power for people within fixed income, which forces them to manage their demand. Furthermore, this management of demand leads to a decrease in the living standard of the people and an increase in poverty (Hussain & Malik, 2011).

Ravallion (1998) investigated the impact of higher food prices on poverty in India. Utilizing the data from 1959 to 1994, results showed that higher prices have a strong and positive impact on poverty. Similarly, Datt and Ravallion (2002) proved the positive impact of inflation on poverty in Indian states. Maluleke (2012) studied to investigate the relationship between poverty and inflation in Sharpeville, utilized the 2009 survey data. Results showed that inflation negatively affects poverty.

A study using 115 developing countries in a panel data setup, Talukdar (2012) explored inflation and its

effect on poverty over the period 1981 to 2008. The author reported that rising prices are causing poverty; further, this relation was robust in sub-samples of countries according to income group. Pervez and Rizvi (2014) studied Pakistan to analyze the determinants of poverty from 1980 to 2010. They confirmed that in the long run, inflation has a significant positive effect on poverty.

Impact of Capital Formation on Poverty

Hakim et al. (2010) studied social capital and poverty in Malaysia. The results of the logit model showed that human capital and physical capital play a significant role in poverty alleviation. Norton (2010) conducted a study to examine the relationship between capital formation and poverty; the estimated OLS model showed that investment helps to reduce poverty.

Afzal et al. (2012) studied the relationship between physical capital and economic growth in Pakistan. AutoRegressive Distributed Lagged model (ARDL) results show that both the Short run (SR) and Long run (LR) effect of physical capital on Real Gross Domestic Product (RGDP) is positive and significant. Hanif and Arshed (2016) showed a similar outcome for the case of SAARC economies. Akobeng (2017) investigated the relationships between gross capital formation, institutions, and poverty in Sub-Saharan Africa. Using the panel dataset of 41 sub-Saharan African countries during the period 1981 to 2010, study results showed that physical capital reduces poverty; thus, fixed capital formation is an instrument for reducing poverty in SSA countries. Arshed et al. (2018) evaluated the effect of physical capital on income inequality in the case of SAARC economies and concluded that physical capital has a negative effect on income inequality. Similar is the case for Asian economies (Arshed et al., 2019a).

Methods

Panel Data Framework

The study has used the panel data framework. It reduces collinearity among the explanatory variables and has a higher ability to mitigate endogeneity. Because of the large sample, it provides effective results. Regarding specification, it allows us to mix time-invariant and cross-section invariant variables to go near to the theory.

Sample of the Study

The sample selected in this study is from the SAARC region, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Thirty-four years of data were collected, from 1983 to 2016. The purpose of selecting the SAARC region is that this region has a very high incidence of poverty, and cross-border tension is leaking valuable government expenditures in terms of defense expenditure (Arshed et al., 2017c).

Data Source and Variables

Table 1 shows the 12 variables which are used in this study. All the variables are converted into natural log form to facilitate elasticity based comparison and diminishing outlier based heteroskedasticity (Benoit, 2011).

Econometric Model

To build the education-poverty Kuznets curve, this study will use the square form of primary, secondary, and tertiary enrollment with other control variables, similar to the study of Arshed et al. (2017c). The functional form of the model is following

$$POV = f(PRI, SEC, TER, EXP, LF, CAP, GDP, CPI)$$

The stochastic model based on the functional form is provided below.

$$POV_{it} = \beta_0 + \beta_1 PRI_{it} + \beta_2 PRI_{it}^2 + \beta_3 SEC_{it} + \beta_4 SEC_{it}^2 + \beta_5 TER_{it} + \beta_6 TER_{it}^2 + \beta_7 EXP_{it} + \beta_8 LF_{it} + \beta_9 CAP_{it} + \beta_{10} GDP_{it} + \beta_{11} CPI_{it} + e_{it} \quad (1)$$

where

POV = Natural Logarithm of Poverty

PRI = Natural Logarithm of Primary enrollment

PRI² = Square of Natural Logarithm of Primary enrollment

SEC = Natural Logarithm of Secondary enrollment

SEC² = Square of Natural Logarithm of Secondary enrollment

TER = Natural Logarithm of Tertiary enrollment

TER² = Square of Natural Logarithm of Tertiary enrollment

EXP = Natural Logarithm of Public expenditure of education

LF = Natural Logarithm of Total Labor Force
 CAP = Natural Logarithm of Capital Stock
 GDP = Natural Logarithm of Gross Domestic Product
 CPI = Natural Logarithm of Consumer Price Index

Here the cut off value for primary enrollment is

$$\begin{aligned} 9POV / 9PRI &= \beta_1 + 2\beta_2 PRI^* \\ PRI^* &= -\beta_1 / 2\beta_2 \end{aligned} \quad (2)$$

Similarly, cut-off values for secondary and tertiary enrollment can be calculated. This cut-off value provides the minima (for U shaped function) or maxima (for inverted U shaped function) of the quadratic function, depending on the sign of the level and square variable coefficient (Chiang & Wainwright, 2005).

Table 1 shows the variables used in the study. The poverty headcount ratio at \$3.10 a day (% of the population) is used as a dependent variable collected from “World Development Indicators” (WDI).

Education enrolment (PRI, SEC, and TER) is a proxy for education level, as proposed by Gregorio and Lee (2002) and Arshed et al. (2017c), were taken from WDI. Economic Activity (GDP) is proxied using real gross domestic product (constant LCU), following Afzal et al. (2010) and Hanif and Arshed (2016). Government expenditure on education (as % of GDP) is a proxy for public investment in Education (EXP) as proposed by Sylwester (2002) and Karim (2015). Physical capital (CAP) is proxied using a gross fixed capital formation, and labor force (LF) represents the total labor force; both of these are adapted from Kerckhoff et al. (2001). Inflation is proxied of Consumer Price Index (2010=100).

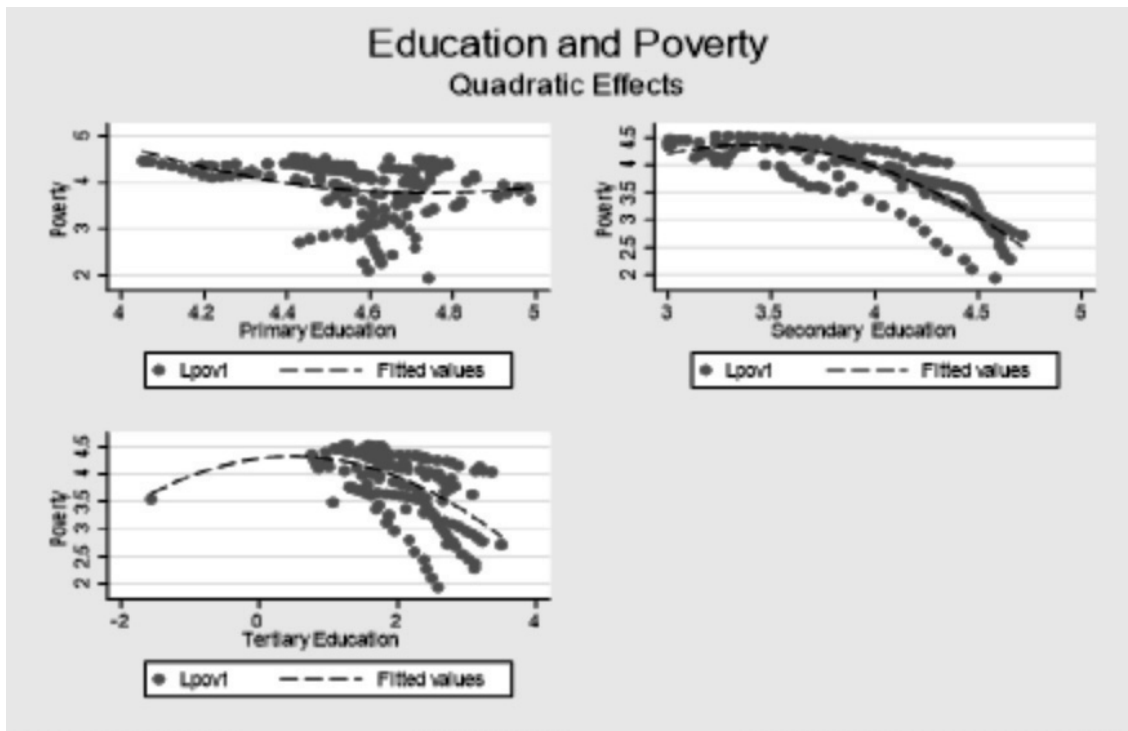
Pre-tests

This study has used the two tests that confirm the presence of unit root, that is, Levin, Lin, and Chu (Levin et al., 2002) are also called LLC and Im, Pesaran, and Shin (Im et al., 1997) also called IPS, if there is the presence of unit root that necessitates the need for confirmation of co-integration. This study

Table 1

Description of Variables Used

Indicator	Symbol	Reference	Description
Poverty	POV	WDI(2017)	Poverty headcount ratio at \$3.20 a day is the percentage of the population living on less than \$3.20 a day at 2011 international prices.
Labor Force	LF	WDI(2017)	Total labor force includes people with ages between 15 and older whose are willing to supply labor for production
Physical Capital	CAP	WDI(2017)	Physical capital is gross fixed capital formed including land improvement, plant, machinery, equipment purchases and construction.
Inflation	CPI	WDI(2017)	Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services.
Expenditure on Education	EXP	WDI(2017)	General government expenditures on education as a percent of GDP
Economic Growth (Constant \$)	GDP	WDI(2017)	At constant purchaser's prices, GDP is a sum of gross value added by resident producers in the economy.
Primary Enrollment	PRI	WDI(2017)	Total children enrolled in primary education as a ratio of total enrollment
Secondary Enrollment	SEC	WDI(2017)	Total children enrolled ins secondary education as a ratio of total enrollment
Tertiary Enrollment	TER	WDI(2017)	Total children enrolled in tertiary education as a ratio of total enrollment



Note: Author Self Calculation

Figure 1. Education Enrollment and the Incidence of Poverty

Table 2

Panel Unit Root Tests

<i>Panel Unit Root Tests</i>				
Tests	<i>LLC Stat. (Prob.)</i>	<i>IPS Stat. (Prob.)</i>	<i>LLC Stat. (Prob.)</i>	<i>IPS Stat. (Prob.)</i>
Spec.	<i>Level</i>		<i>First difference</i>	
POV	4.507 (1.00)	7.280 (1.00)	-2.342 (0.00)*	-2.733 (0.00)*
LF	-2.679 (0.00)*	1.423 (0.92)	0.492 (0.68)	-2.750 (0.00)*
CAP	2.905 (0.99)	4.535 (1.00)	-11.23 (0.00)*	-11.30 (0.00)*
PRI	1.141 (0.87)	3.393 (0.99)	-10.94 (0.00)*	-10.45 (0.00)*
SEC	1.169 (0.88)	3.302 (0.99)	-7.774 (0.00)*	-8.023 (0.00)*
TER	3.948 (1.00)	6.433 (1.00)	-26.26 (0.00)*	-16.54 (0.00)*
GDP	5.012 (1.00)	6.422 (1.00)	-8.051 (0.00)*	-9.224 (0.00)*
EXP	-1.829 (0.03)**	-1.229 (0.10)	-7.120 (0.00)*	-7.259 (0.00)*
CPI	-1.027 (0.15)	2.546 (0.99)	-5.673 (0.00)*	-6.402 (0.00)*

Note: * Significant at 1% ** Significant at 5%

has used Kao's (1999) panel co-integration test. All of these tests are used by Hanif and Arshed (2016) and Asghar et al. (2011).

Estimation Model

Phillips and Hansen (1990) suggested the fully modified ordinary least squares (FMOLS) estimator, which employs a semi-parametric correction to remove the complications that affect the long-run relationship among the co-integrating equation. This FMOLS estimator is asymptotically unbiased (Pedroni, 2000, 2001).

Results

Descriptive Statistics

While comparing the incidence of poverty and the education enrollment among the SAARC economies in Figure 1, it can be seen that it follows a non-linear pattern. Primary enrollment follows U-shaped relationships, whereas secondary and tertiary enrollment follows the inverted U-shaped pattern with poverty. This scatter plot and linear fit graphs hints that the effect of education enrollment at the initial level is different from the effect of education enrollment at a high level. Arshed et al. (2018, 2019a) tested a similar hypothesis for education enrollment while testing it against income inequality. Table 2 shows the results of LLC, and IPS panel unit root tests, whereby other than labor force at 1% and government expenditures at 5%, all the variables are stationary at order 1.

Table 3

Panel Cointegration Test

<i>Kao Residual Cointegration Test</i>		
Test	T-Statistic	Probability value
ADF	-3.12	0.00

Table 3 confirms the presence of co-integration among the selected variables mentioned in Equation 1. Hence, a reliable long-run model can be constituted using these variables.

Estimation Results

Table 4 shows the long-run relationship between poverty and all selected variables. Here, the p-value of the Jarque-Bera test in this model is 0.69, which is

greater than 0.05, hinting that residuals of this model are normally distributed. The R-squared value of the model is 0.95 shows a 95% variation in poverty because of explanatory variables.

In Table 4, it can be seen that all the variables are significant at 5% except LPRI². This means that primary enrollment does not have any quadratic effect (absence of Kuznets curve) on poverty. Consequently, a 1% increase in primary enrollment leads to poverty by 1.1% on average. This poverty aggravating effect of primary enrollment signifies that for the case of SAARC economies, primary education does not impart skills that may increase labor demand. However, an increase in the supply of primary skilled labor would only put downward pressure on wages in the unskilled labor market.

For the case of secondary enrollment, the linear coefficient is positive, whereas the squared variable coefficient is negative. This indicates the presence of inverted U shaped education-poverty Kuznets curve. Initially, a 1% increase in secondary enrollment will increase poverty by 8.4%. However, following beyond this, for every percentage increase in secondary enrollment, the marginal effect will diminish by 1.27%, eventually leading to a decrease in poverty. These results are similar to the studies by Gupta et al. (2002) and Arshed et al. (2018), whereby few secondary skilled laborers are not able to raise higher productivity expectations by employers initially. Hence, they compete in the unskilled/primary skilled labor market. However, with the increase in the ratio of secondary skilled labor, they will create differentiation and thus bargain for and develop a semi-skilled market with higher wages (Akerlof, 1970).

Similarly, for the case of tertiary enrollment, the linear coefficient is negative, but the squared variable coefficient is positive. This indicates a U-shaped relationship with poverty, which is similar to the outcome shown by Arshed et al. (2017c) for the case of inequality. Here, initially, a 1% increase in the tertiary enrollment will lead to a decrease in poverty by 0.84% as labor will enjoy premium skilled labor wages, as suggested by Ravallion and Datt (1996). However, for every percentage increase in the tertiary enrollment, its capacity to decrease poverty decreased by 0.17%, which will eventually become pro-poor. This unexpected result is sample-specific (Arshed et al., 2018). If there are too many highly skilled labor compared to the economy's capacity to absorb, then it

Table 4*Panel Fully Modified Least Squares Estimates*

FMOLS Dependent Variable: POV		
Independent Variable	Coefficient	P-value
PRI	1.108	0.000
PRI ²	-0.143	0.131
SEC	8.432	0.000
SEC ²	-1.274	0.000
TER	-0.841	0.000
TER ²	0.174	0.000
EXP	0.419	0.000
LF	-0.585	0.000
CAP	0.005	0.000
GDP	0.341	0.000
CPI	-0.064	0.000
Regression Diagnostics		
Jarque-Bera	0.728	0.695
R-squared		0.958
Total panel (unbalanced) observations		129

will first decrease their market wages. This will make them poor as most of them had already invested too much in becoming skilled laborers. Secondly, failing to get desired wages, few of the best-skilled labor will migrate out of the country. This will make the rest of the population more miserable as most of the resources invested in the labor are now wasted (De la Croix & Docquier, 2012).

Surprisingly, a 1% increase in the expenditure on education has a positive effect on poverty by 0.41% in the SAARC region. There are a few reasons associated with this positive effect, which is discussed in the literature. First, because of the high population, most of the expenditures are used to meet the non-developmental or non-productive expenditures. Second, the curriculum is not optimized to impart industry-specific skills to the labor. Third, high capital must be accompanied by high physical capital to make it productive (Castro-Leal et al., 1999; Jung & Thorbecke, 2003). Lastly, some labor graduates with relevant skills are discouraged because of the lack of job opportunities and decide to migrate.

A 1% increase in labor force shows a -0.58% decline in poverty, whereas a 1% capital stock increase than poverty increase by 0.005%. Afzal et al. (2012) provided similar results. Further, a 1% increase in GDP leads to a 0.33% increase in poverty. The same results are found by Hidalgo-Hidalgo and Iturbe-Ormaetxe (2014). With an increase in economic growth, rich people become more affluent, and poor people become worse off, so poverty increases. Lastly, with a 1% inflation increase, poverty is decreased by -0.06%, the same results as Maluleke (2012) and Talukdar (2012). These unexpected results of GDP, government expenditures, and capital are the possible explanations of the U-shaped relationship of tertiary enrollment and poverty for the case of SAARC countries.

Figure 2 plots the quadratic effect of three types of education enrollment on poverty for the case of SAARC countries, which are based on the coefficient of level and square coefficient and the mean and standard deviation of the education enrollment using methods provided by Dawson (2014). The lines trace the same effects are interpreted earlier.

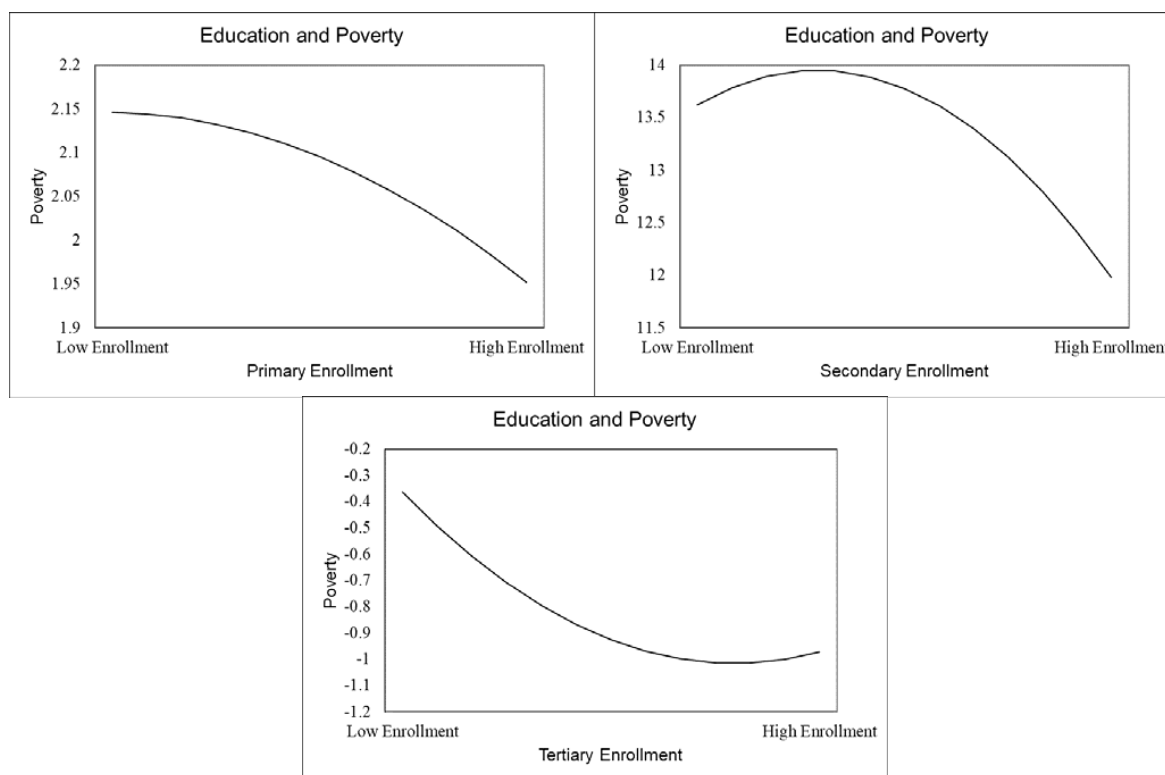


Figure 2. Effects of Education Enrollment

Linear Effects

This study has incorporated the effects of secondary and tertiary enrollment in the non-linear (quadratic) form. Further, it estimated the optimal/cut-off value of these indicators of education enrollment, as shown in Equation 2 (Arshed et al., 2018, 2019a). For secondary education, the level form was positive, and the squared form was negative. It means that there is a need to have an education above the cut off value to have a negative effect on poverty. For tertiary education, the level form is negative, and the squared form is positive. This means that very high tertiary education beyond the cut off value will cause poverty. This is because the first derivative is positive (i.e., level coefficient being positive), and the second derivative is negative (i.e., squared coefficient is negative; Chiang & Wainwright, 2005). It can be seen that if a country has enrollment beyond 27.36% in secondary and below 11.28% in tertiary education, it will lead to a reduction in poverty. Table 5 provides the country-wise incidence of secondary and tertiary enrollment.

Table 5

Positioning of SAARC Economies on Quadratic Education Enrollment Curve

Cut off and Average Education Enrollment		
	Secondary	Tertiary
Optimal Education	27.36%	11.28%
Afghanistan	22.42%	2.46%
Bangladesh	36.59%	6.42%
Bhutan	30.88%	3.18%
India	48.91%	9.68%
Maldives	81.45%	8.41%
Nepal	50.91%	10.17%
Pakistan	41.68%	6.75%
Sri Lanka	27.38%	3.90%

Table 6 shows the linearized marginal effect of a 1% increase in overall education enrollment for each country in the SAARC region. It assumes average enrollment as a benchmark level of education enrolment to calculate optimal education level (shown as PRI* in Equation 2). Results show that the effect of education on poverty alleviation is elastic only in the Maldives. At the same time, it is inelastic for India, Nepal, Pakistan, and the overall region. For Afghanistan, Bangladesh, Bhutan, and Sri Lanka, the

effect of 1% increase in each of primary, secondary, and tertiary education enrollment leads to an increase in poverty.

Figure 3 plots the current scenario of the net linearized effect of education enrollment on the poverty incidence of SAARC countries. Countries like Afghanistan, Bangladesh, Bhutan, and Sri Lanka need to prioritize their efforts towards boosting enrollment in secondary education.

Table 6

Linearized Effects of Education

Net Effect of Education on Poverty						
SAARC Economy	Primary Enrollment	Secondary Enrollment		Tertiary Enrollment		Net Effect
	Linear Effect	Mean	Linear Effect	Mean	Linear Effect	
Afghanistan	1.108	3.11	0.51	0.90	-0.52	1.088
Bangladesh	1.108	3.60	-0.74	1.86	-0.20	0.208
Bhutan	1.108	3.43	-0.31	1.16	-0.44	0.368
India	1.108	3.89	-1.48	2.27	-0.05	-0.432
Maldives	1.108	4.40	-2.78	2.13	-0.10	-1.772
Nepal	1.108	3.93	-1.58	2.32	-0.04	-0.512
Pakistan	1.108	3.73	-1.07	1.91	-0.18	-0.142
Sri Lanka	1.108	3.31	-0.002	1.36	-0.37	0.738
All	1.108	3.68	-0.94	1.70	-0.25	-0.092

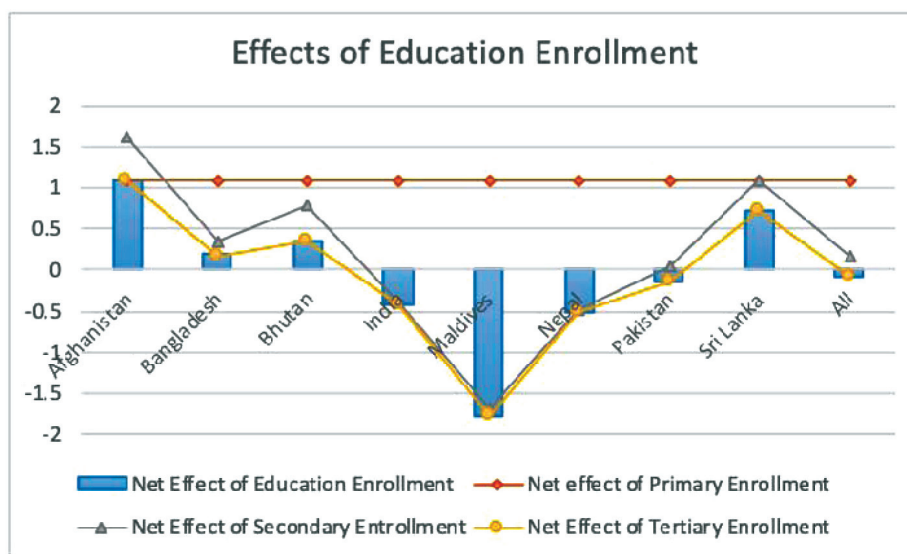


Figure 3. Net Effect of Education Enrollment

Discussion

Surprisingly, this study highlighted that there is no education–poverty Kuznets curve for primary and tertiary enrollment. For the primary sector, it is mostly reasoned as of non-regularized non-skilled labor market. Because of high globalization and commercialization, primary skilled labor is not productive enough to participate in the production process. Hence, households and firms employ them for general or irregular chores for which no formal contract must be signed. Thus, primary educated labor ends up earning subsistence wages.

For the case of labor who is skilled up to secondary level, they will have to compete in the entry-level job against experienced primary skilled labor, leading them to survive in below poverty line situation if they are located in an economy where the secondary enrollment is lower than 27.36%. However, with a consistent increase in the number of secondary skilled labor beyond 27.36%, they create a new secondary skilled labor market for themselves. In this market, they can bargain for higher wages against better productivity. As these wages are based on productivity, it leads to alleviating labor out of poverty.

The unexpected outcome of tertiary enrollment that is similar to Arshed et al. (2017c) is because of many reasons which are discussed earlier. The misalignment of the skilled labor imparted in tertiary education and demand for skills in the market. The lack of economic activity in the SAARC region forces laborers to work in the semi-skilled labor market or migrate out of the country, causing a brain drain. Both of these cases have pro-poor outcomes. The U-shaped effect of tertiary education can be transformed into an inverted U shape. This is possible if government expenditures on education are optimized to make tertiary labor supply compatible with tertiary labor demand.

This study investigated the educational enrollment level (primary, secondary, and tertiary) and its non-linear impact on poverty. It was expected that education enrollment would follow the education-poverty Kuznets curve. Other indicators included are labor force, physical capital, government expenditures, economic growth, and general prices. The data used in this study ranged from 1983 to 2016 for SAARC countries.

Because of long panel data, this study has opted for a dynamic panel data model after testing for panel unit root tests and panel co-integration. The

long-run coefficients are estimated using the FMOLS model. The results were surprising as only secondary education followed the education-poverty Kuznets curve; this is mainly because of the unregulated labor market and persistence of high income inequality.

The summarized form of linearized effects of education on poverty showed that only India, Maldives, Nepal, and Pakistan could alleviate poverty because of their current educational setup. Out of these, Maldives outperformed among all countries.

Policy Implications

Developing countries tend to face a scarcity of development expenditures. Hence, it is pertinent for the government to estimate the optimal spending requirements. This study evaluates the effect of the incidence of three types of education enrollment on the poverty of the SAARC region. Based on the study, the following are a few implications.

Policymakers should provide some respite to the primary educated workers. It includes work conditions or the provision of subsidized skill development avenues, which can eventually increase their productivity and income.

The SAARC region is not producing very high tech goods, represented by the confirmation of the Kuznets curve for secondary education. Thus, policymakers should push for a greater share of secondary enrolled labor, which is relevant for the industry requirements.

Similarly, labor who are tertiary skilled should be facilitated by the government on priority bases, and their placement in appropriate jobs should be done as soon as possible so that the time and resources spent on the development of highly skilled labor does not go to waste. Government expenditures must develop infrastructure that can produce the relevant skilled labor, which is demanded by the country.

Lastly, high but managed growth of the economy is important to ensure the expansion of businesses, which can later become demanders of labor in such a populous region of the world. Prices must be kept in check to provide opportunities for the poor population to save from their earnings.

Declaration of ownership:

This report is our original work.

Conflict of interest:

None.

References

- Afzal, M., Malik, M. E., Begum, I., Sarwar, K., & Fatima, H. (2012). The relationship among education, poverty and economic growth in Pakistan: An econometric analysis. *Journal of Elementary Education*, 22(1), 23–45.
- Aghion, P., Caroli, E., & Garcia-Penalosa, C. (1999). Inequality and economic growth: The perspective of the new growth theories. *Journal of Economic Literature*, 37(4), 1615–1660.
- Aghion, P., & Howitt, P. (1992). A model of growth through creative destruction. *Econometrica*, 60(2), 385–406.
- Agarwal, P. (2007). Economic growth and poverty reduction: evidence from Kazakhstan. *Asian Development Review*, 24(2), 90–115.
- Akerlof, G. A. (1970). The market for “lemons”: Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84(1), 488–500.
- Akobeng, E. (2017). Gross capital formation, institutions, and poverty in Sub-Saharan Africa. *Journal of Economic Policy Reform*, 20(2), 136–164.
- Anwar, A., Arshed, N., & Anwar, S. (2017a). Socio-economic determinants of crime: An empirical study of Pakistan. *International Journal of Economics and Financial Issues*, 7(1), 312–322.
- Arshed, N., Alamgir, S., & Aziz, O. (2017b). Structural determinants of poverty in Pakistan. *International Journal of Economics and Financial Research*, 3(1), 1–7.
- Arshed, N., Anwar, A., Kousar, N., & Bukhari, S. (2018). Education enrollment level and income inequality: A case of SAARC economies. *Social Indicators Research*, 140(3), 1211–1224.
- Arshed, N., Hassan, M. S., & Aziz, O. (2020). Does income inequality lead to education inequality? A cross sectional study of Pakistan. *UMT Education Review*, 3(1), 46–69.
- Arshed, N., Anwar, A., Hassan, M. S., & Bukhari, S. (2019a). Education stock and its implication for income inequality: The case of Asian economies. *Review of Development Economics*, 23(2), 1050–1066.
- Arshed, N., Kalim, R., & Anwar, A. (2019b). Can government expenditures deter crime? An empirical analysis across the districts of Punjab. *Research Journal of Applied Science*, 14(11), 388–395.
- Asghar, N., Nasreen, S., & Rehman, H. (2011). The relationship between FDI and economic growth in selected Asian countries: A panel data analysis. *Review of Economics & Finance*, 2, 84–96.
- Barro, R. J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, 106(2), 407–443.
- Barro, R. J. (1996). *Determinants of economic growth: A cross-country empirical study* (Working Paper No. w5698). National Bureau of Economic Research. Retrieved from <http://www.nber.org/papers/w5698>
- Barro, R. J., & Lee, J. W. (1993). International comparisons of educational attainment. *Journal of Monetary Economics*, 32(3), 363–394.
- Becker, G. S. (1995). *Human capital and poverty alleviation*. World Bank, Human Resources Development and Operations Policy.
- Benoit, K. (2011). Linear regression models with logarithmic transformations. *London School of Economics, London*, 22(1), 23–36.
- Bhagwati, J. (2001). Growth, poverty and reforms. *Economic and Political Weekly*, 36(10), Online article available at <https://www.epw.in/journal/2001/10/special-articles/growth-poverty-and-reforms.html>.
- Bils, M., & Klenow, P. J. (2000). Does schooling cause growth? *American Economic Review*, 90(5), 1160–1183.
- Black, J. (2003). *A dictionary of economics*. Oxford University Press.
- Carm, E., Mageli, E., Berryman, L. N., & Smith, R. (2003). *Education and its impact on poverty: An initial exploration of the evidence*. Oslo University College.
- Castro-Leal, F., Dayton, J., Demery, L., & Mehra, K. (1999). Public social spending in Africa: Do the poor benefit? *The World Bank Research Observer*, 14(1), 49–72.
- Chiang, A. C., & Wainwright, K. (2005). *Fundamental methods of mathematical economics*. McGraw-Hill Irwin.
- Colclough, C., & Arif, G. M. (2005). Does education abroad help to alleviate poverty at home? An assessment [with comments]. *The Pakistan Development Review*, 44(4), 439–454.
- Crenshaw, E., & Ameen, A. (1994). The distribution of income across national-populations: Testing multiple paradigms. *Social Science Research*, 23(1), 1–22.
- Datt, G., & Ravallion, M. (2002). Is India’s economic growth leaving the poor behind? *The Journal of Economic Perspectives*, 16(3), 89–108.
- Dawson, J. F. (2014). Moderation in management research: What, why, when, and how. *Journal of Business and Psychology*, 29(1), 1–19.
- De la Croix, D., & Docquier, F. (2012). Do brain drain and poverty result from coordination failures? *Journal of Economic Growth*, 17(1), 1–26.
- Deaton, A., & Dreze, J. (2001). Trade, growth, and poverty. *Finance and Development*, 38, 16–19.
- Deyshrappria, R. (2018). Globalization–poverty nexuses: Evidences from cross-country analysis. *Empirical Economic Review*, 1(1), 25–48.
- Dollar, D., & Kraay, A. (2002). Growth is good for the poor. *Journal of Economic Growth*, 7(3), 195–225.

- Fan, S., Hazell, P., & Thorat, S. K. (2000). The impact of public expenditure on poverty in rural India. *Economic and Political Weekly*, 35(40), 3581–3588.
- Georgieva, K. (2018, July 16). *Technology can help spring workers from the informality trap*. Medium. Retrieved from <https://medium.com/world-of-opportunity/technology-can-help-spring-workers-from-the-informality-trap-e88b76e2d9dd>
- Gladieu, S. (2018). *The state of social safety nets 2018*. World Bank. http://www.worldbank.org/en/topic/socialprotectionandjobs/publication/the-state-of-social-safety-nets-2018?CID=POV_TT_Poverty_EN_EXT
- Gregorio, J. D., & Lee, J. W. (2002). Education and income inequality: New evidence from cross-country data. *Review of Income and Wealth*, 48(3), 395–416.
- Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does corruption affect income inequality and poverty? *Economics of Governance*, 3(1), 23–45.
- Hakim, R. A., Razak, N. A. A., & Ismail, R. (2010). Does social capital reduce poverty? A case study of rural households in Terengganu, Malaysia. *European Journal of Social Science*, 4(14), 556–566.
- Hanif, N., & Arshed, N. (2016). The relationship between school education and economic growth: SAARC countries. *International Journal of Economics and Financial Issues*, 6(1), 294–300.
- Hanushek, E. A., & Kimko, D. D. (2000). Schooling, labor-force quality, and the growth of nations. *American Economic Review*, 90(5), 1184–1208.
- Harper, C., Marcus, R., & Moore, K. (2003). Enduring poverty and the conditions of childhood: Life course and intergenerational poverty transmissions. *World Development*, 31(3), 535–554.
- Hassan, M. S., Akber, M. S., Wajid, A., & Arshed, N. (2016). Poverty, urbanization and crime: Are they related in Pakistan? *International Journal of Economics and Empirical Research*, 4(9), 483–492.
- Hassan, M. S., Bukhari, S., & Arshed, N. (2020). Competitiveness, governance and globalization: What matters for poverty alleviation? *Environment, Development and Sustainability*, 22(4), 3491–3518.
- Hidalgo-Hidalgo, M., & Iturbe-Ormaetxe, I. (2014). *Long-run effects on poverty of public expenditure in education* (IVIE Working Paper No. 6). Universitat de les Illes Balears, Palma.
- Im, K. S., Pesaran, M. H., & Shin, Y. (1997). *Testing for unit roots in heterogeneous panels*. University of Cambridge.
- Ijaiya, G. T. (1998). Alleviating poverty in Nigeria: Investing in education as a necessary recipe. *Ilorin Journal of Education*, 18, 125–131.
- Janjua, P. Z., & Kamal, U. A. (2011). The role of education and income in poverty alleviation: A cross-country analysis. *The Lahore Journal of Economics*, 16(1), 143–272.
- Jung, H. S., & Thorbecke, E. (2003). The impact of public education expenditure on human capital, growth, and poverty in Tanzania and Zambia: A general equilibrium approach. *Journal of Policy Modeling*, 25(8), 701–725.
- Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. *Journal of Econometrics*, 90(1), 1–44.
- Karim, M. R. (2015). Public education spending and income inequality in Bangladesh. *International Journal of Social Science and Humanity*, 5(1), 75–79.
- Kaza, S., & Yao, L. (2018, March 2). *Landslides, dumpsites, and waste pickers*. World Bank. Retrieved from https://blogs.worldbank.org/sustainablecities/landslides-dumpsites-and-waste-pickers?CID=POV_TT_Poverty_EN_EXT
- Kerckhoff, A. C., Raudenbush, S. W., & Glennie, E. (2001). Education, cognitive skill, and labor force outcomes. *Sociology of Education*, 74(1), 1–24.
- Kuznets, S. (1956). Quantitative aspects of the economic growth of nations: Level and variability of rates of growth. *Economic Development and Cultural Change*, 5(1), 5–94.
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1–24.
- Hussain, S., & Malik, S. (2011). Inflation and economic growth: Evidence from Pakistan. *International Journal of Economics and Finance*, 3(5), 262–276.
- Maluleke, T. C. (2012). *The relationship between poverty and inflation in Sharpeville* (Unpublished doctoral dissertation). North-West University, Potchefstroom, South Africa.
- Mamoon, D., Raza, S., & Arshed, N. (2015). Impact of health capital and education on infant mortality rate of Districts of Punjab. *Journal of Management and Research*, 1(2), 1–9.
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407–437.
- Munir, K., & Kanwal, A. (2020). Impact of educational and gender inequality on income and income inequality in South Asian countries. *International Journal of Social Economics*, 47(8), 1043–1062.
- Nasa'i, A. I. S. (2006). *Sunnan an Nasa'I – English Translation with Arabic Text*. Kitab Bhavan. ISBN no. 8171513670
- Norton, S. W. (2010). *Human capital, institutions, and world poverty*. Paper presented at Western Economics Association, International Meeting, July 2004, Vancouver, B.C.
- Pedroni, P. (2000). Critical values for cointegration tests in heterogeneous cointegrated panels. *Advances in Econometrics*, 61(4), 653–670.

- Pedroni, P. (2001). Fully modified OLS for heterogeneous cointegrated panels. In B. H. Baltagi, T. B. Fomby, & R. C. Hill (Eds.), *Nonstationary panels, panel cointegration, and dynamic panels* Vol. 15 (pp. 93–130). Emerald Group Publishing Limited.
- Pervez, S. (2014). The impact of education on poverty reduction: A co-integration analysis for Pakistan. *Journal of Research in Economics and International Finance*, 3(4), 83–89.
- Pervez, S., & Rizvi, S. B. U. H. (2014). An empirical analysis of determinants of poverty: A co-integration analysis. *Issues*, 2(1), 5–20.
- Phillips, P. C., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with I(1) processes. *The Review of Economic Studies*, 57(1), 99–125.
- Psacharopoulos, G., & Patrinos, H. A. (2004). Returns to investment in education: A further update. *Education Economics*, 12(2), 111–134.
- Ravallion, M. (1998). *Poverty lines in theory and practice* (Vol. 133). World Bank Publications.
- Ravallion, M., & Datt, G. (1996). How important to India's poor is the sectoral composition of economic growth? *The World Bank Economic Review*, 10(1), 1–25.
- Roemer, M., & Gugerty, M. K. (1997). *Does economic growth reduce poverty?* (Discussion Paper No. 5). CAER II.
- Simon-Oke, O. O. (2014). Foreign private investment, capital formation and poverty reduction in Nigeria. *European Journal of Business and Social Sciences*, 2(10), 157–168.
- Self, S., & Grabowski, R. (2004). Does education at all levels cause growth? India, a case study. *Economics of Education Review*, 23(1), 47–55.
- Sylwester, K. (2002). Can education expenditures reduce income inequality? *Economics of Education Review*, 21(1), 43–52.
- Talukdar, S. R. (2012). *The effect of inflation on poverty in developing countries: A panel data analysis* (Unpublished doctoral dissertation). Texas Tech University, Texas USA.
- Tendulkar, S. D. (1998). Indian economic policy reforms and poverty: An assessment. In I. J. Ahluwalia & I. M. D. Little (Eds.), *India's economic reforms and development: Essays for Mohan Singh* (pp. 280–308). Oxford University Press.
- Tendulkar, S. D., & Jain, L. R. (1995). Economic growth, relative inequality, and equity: The case of India. *Asian Development Review*, 13, 138–168.
- Thapa, S. B. (2015). The relationship between education and poverty in Nepal. *Economic Journal of Development Issues*, 15(1-2), 148–161.
- Tilak, J. B. (1999). Education and poverty in South Asia. *Prospects*, 29(4), 517–533.
- Tilak, J. B. (2002). Education and poverty. *Journal of Human Development*, 3(2), 191–207.
- Tilak, J. B. (2007). Post-elementary education, poverty, and development in India. *International Journal of Educational Development*, 27(4), 435–445.
- Todaro, M. P., & Smith, S. C. (2015). *Economic development* (12th ed.). Pearson.
- United Nations Industrial Development Organization. (2003). *Poverty reduction in Latin America and Caribbean within the framework of sustainable development*. https://www.unido.org/sites/default/files/2007-11/19592_SRTEnglishSummary_0.pdf
- Verner, D. (2004). *Education and its poverty-reducing effects: The case of Paraíba, Brazil* (Policy Research Working Paper 3321). World Bank.
- World Bank. (1999). *Education sector strategy*. World Bank.
- World Bank. (2000). *World Bank Development Report 2000-2001, Attacking Poverty*. Retrieved from <http://documents1.worldbank.org/curated/en/230351468332946759/pdf/226840WDR00PUB0ng0poverty0200002001.pdf>
- World Bank. (2018a). *Decline of global extreme poverty continues but has slowed*. World Bank. Retrieved from http://www.worldbank.org/en/news/press-release/2018/09/19/decline-of-global-extreme-poverty-continues-but-has-slowed-world-bank?CID=POV_TT_Poverty_EN_EXT
- World Bank. (2018b). *Investing in nutrition for better future in Afghanistan*. World Bank. Retrieved from http://www.worldbank.org/en/country/afghanistan/publication/investing-in-nutrition-for-a-better-future-in-afghanistan?CID=POV_TT_Poverty_EN_EXT
- World Bank. (2018c). *Gains in financial inclusion, gains for a sustainable world*. World Bank. Retrieved from http://www.worldbank.org/en/news/immersive-story/2018/05/18/gains-in-financial-inclusion-gains-for-a-sustainable-world?CID=FAM_TT_FinanceMarkets_EN_EXT
- World development indicators. (2017). World Bank.
- Zaman, K., Rashid, K., Khan, M. M., & Ahmad, M. (2011). Panel data analysis of growth, inequality, and poverty: Evidence from SAARC countries. *Journal of Yasar University*, 21(6), 3523–3537.