

Does Schooling Contribute to Economic Growth? A Comparative Study in Pakistan and Afghanistan

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Abstract:

This study examines the impact of schooling on gross domestic product (GDP) per capita growth of Pakistan and Afghanistan over the period of 2002–2020. Based on the nature of the data, the fully modified ordinary least squares (FMOLS) technique is applied for the estimations. The empirical outcomes of the study revealed that the primary, secondary, tertiary school enrollments have inspiring and remarkable outcome on GDP growth in both Afghanistan and Pakistan. This study concluded that the education is significantly contributed to the GDP growth both in Pakistan and Afghanistan. However, primary, and secondary school enrollment has more effective to influence Pakistan's GDP growth than Afghanistan in the long term while tertiary school enrollment has more effective to influence GDP growth in Afghanistan than Pakistan. The findings suggests that policy makers of both countries need to devise sound policies, to enhance school enrollment, allocate more budget to education sector, and the ultimate results would be to accelerate growth and improve social welfare.

Keywords: Education, Economic Growth, FMOLS, Pakistan and Afghanistan

I. Introduction

Education is considered as a key factor for economic development. Education is the fundamental right of every child. It provides opportunities for individual to improve their social and economic life. Education plays a major role in the progress of any country, may it be developed or developing. Without education economic development is not possible, both education and GDP per capita is correlated with each other. Education is a way through which a society shares its knowledge from one generation to another. Therefore, education is the most essential and plays a very crucial role in human resource

development (Khan *et al.*, 2014). Rangazas (2000: 397) mentioned that human capital was developed through education. The study of Barro (2013) also finds that education is positively related to growth. He also stated that education of male and female is most essential for growth (P. 302).

Human capital is the major factor which changes the economic outlook of a country. Different growth models also give importance to human capital. According to Mankiw *et al.* (1992) the neoclassical growth model considers physical and human capital essential for economic growth. While the endogenous growth model considered that investment in human capital was the most essential factor for economic growth. Many prior studies such as (Romer, 1990; Segrestrom, 1998; Fleisher *et al.*, 2010; Pelinescu, 2015) assumes that human capital has non-declining returns and stimulate economic growth. Lucas (1990) found human capital complementary factor for growth in poor countries as compared to physical capital. The studies of Barro (1991), Benhabib, and Spiegel (1994) find that education is positively related to the GDP per capita of a country. The study of Loening *et al.* (2010) examines the connection between schooling and GDP for Guatemala and they found that primary education is most crucial than secondary and tertiary education for economic growth. While Shaihani *et al.* (2011) for the case of Malaysia found that only secondary education has a constructive impact on GDP growth in the short run. While the findings of Behrooznia *et al.* (2016) for the case of 40 Asian countries show that education has no effect on GDP. Wang *et al.* (2016) analyzed the impact of higher education on GDP growth of China during 1990-2014 by using co-integration technique and found positive connection between GDP growth and higher education. Ali *et al.* (2018) found a significantly strong connection between human capital and GDP growth. Their findings show that human capital has an encouraging impact on growth but only the better-quality education play a crucial role in economic growth of a country. They suggested that high quality education should be provided to achieve higher growth.

Wasif (2018) noted that according to the UNDP, Pakistan has been started its NHDR reported in 2017 that 77% youth in Pakistan abandon education due to financial reasons. The report further underlining the existing net enrolment growth rate of the country of 0.92% envisages that it will take more 60 years to touch the mark of zero out-of-school children. Likewise, according to the UNICEF (2018) at least 3.69 million children in warfare in Afghanistan unable to go to school, where the ratio of girls is high and recorded 60%. The education system of Afghanistan has been confounded by more than 30 years of continued conflict. It has been observed that in most of the poorest and remote areas, enrolment levels differ expansively and girls still deficit equal access. Though, a resilient quality education system is vital to receiving more children in school, keeping them there, and facilitating them to become healthy and responsible inhabitants.

The prosperity of every country depends upon the education level of its citizens because education is a key towards progress and development. So, quality education should be provided to every child to accomplish higher level of GDP growth and economic development. Therefore, the broad purpose of this study is to analyze empirically the relationship between school enrollment and economic growth in two countries namely Pakistan and Afghanistan over the period of 2002 to 2020. This is a very fresh and updated holistic empirical comparative study to investigate the impact of school enrollment along with some other macroeconomic variables on GDP growth of Pakistan

and Afghanistan. Most of the previous literature give stressed on either one or other factors but this study analyze all the possible factors which play some role in achieving higher economic growth. This study also includes the latest data which can help in explaining the most current situation of the problem.

The rest of the study is organized as follows; section two and three present literature review and methodology respectively. Section four and five represents empirical results and conclusion respectively.

II. Literature Review

A lot of work is done in the context of human capital and GDP growth, while a comparative study in the context of Afghanistan and Pakistan are still deficient. Prior studies on the examined linkages between schooling level and GDP growth, like, Liu and Armer (1993) show positive influence of education on GDP growth but only at primary level for the case of Taiwan. Similarly, Tallman and Wang (1994) found positive connection between higher education and GDP growth for Taiwan. On the other hand, Knowles and Owen (1995) examine connection between education, health and GDP growth and they conclude that the health is more effective than education to influence GDP growth. According to Mingat and Tan (1996) that the tertiary school enrollment has significant effect on GDP growth in developed economies. Similarly, the effect of primary education has optimistic effect on GDP growth in the underdeveloped economies and secondary level schooling has a noteworthy and optimistic effect on GDP growth in developing economies. Emadzadeh (2000) found the impact education on GDP growth positive and significance in the of Iran and conclude that human capital play better role than physical capital in the development and progress of a nation. Similarly, Bills and Klenow (2000) found school enrollment is the key factor to higher and faster GDP growth. However, Hanushek and Kimko (2000) considered quality education as a key element for output growth. Asteriou and Agiomirgianak (2001) found the considerable connection between school enrollment and GDP in Greece. Lin (2003) also found constructive connection between schooling and GDP growth for Taiwan. While for the case of China higher education has more efficient than primary and secondary schooling to influence GDP growth (Chi, 2008). However, the findings of Pereira and Aubyn (2009) show the impact of primary and secondary level schooling was positively related to GDP growth in Portugal, while education at the tertiary level has no impact on GDP growth. They concluded that secondary and primary level education has significantly contributed toward growth. Similarly, Nowak and Dahal (2016) in their study for Nepal during 1995-2013 found secondary education more important factor for economic growth. Kotaskova et al. (2018) find that education levels and GDP growth has strong significantly positive connection in India during 1975-2016.

Economy of Pakistan also suffers from a lot of economic, social, and educational problems since 1947. Since independence Pakistan face a lot of problems in all sectors of the economy but with the passage of time Pakistan is moving towards prosperity and development. Some studies though analyzed the role of education in the influence of GDP growth. For example, Husain et al. (2003) and Ali et al. (2012), found the impression of education is a statistically significant on GDP growth of Pakistan. Afzal et al. (2010) and Kakar et al. (2011) also found that human capital plays a very central role in the growth of Pakistan. Behrman et al (2008) study human capital and growth relationship and found that quality education has constructive impression on GDP growth

especially in rural areas. Their study results show that the return of high-quality education is more than the return of poor-quality education. Afzal et al. (2013) found in their study that education has a positive impact on growth while inflation is negatively related with economic growth of Pakistan during 1971-2011. Javed et al. (2013) also found positive relation of health, education, and growth for Pakistan during the period of 1978-2008. They used co-integration test for estimation and found positive impact of health and education on growth. According to Hanif and Arshed (2016) tertiary education is more important than secondary and primary schooling for GDP growth of a country.

In a similar vein, the history of education in Afghanistan is always full of troubles and especially in case of female education. Female in Afghanistan face a lot of challenges in the way of education like: Insecurity, inadequate transport facilities, lack of female teachers, forced and early marriages of girls, long distances of school from home etc. in a study, Carberry and Faizy (2013) mentioned that the main reason of low or poor enrollment rate in Afghanistan is poor economic condition. Most people in Afghanistan were poor they cannot afford the education expenditure of their children. Moreover, Afghanistan education also faces the shortage of school buildings, proper classrooms, books, lack of qualified teachers and mostly female teachers. According to Aturupane (2013) war and political instability is responsible for low enrollment rate in Afghanistan. Another reason of low enrollment is custom and tradition. Around 50% of Afghan population is Pashtun and Pashtun has their own traditions (Ritscher, 2012). Some selected previous studies on the relationship between education and growth are given in Table 1.

Table 1: Summary of relevant empirical literature

Author (s)	Time Period & Country(s)	Method Used	Dependent variable	Education Indicator(s)	Findings
Maneejuk and Yamaka (2021)	ASEAN-5 (2000-2018)	Ridge Kink Regression	Real GDP per capita	Primary, Secondary and Tertiary	Secondary and Tertiary (+)
Azam et al (2020)	India, 1980-2018	ARDL	Real GDP	life, expectancy	Life expectancy (+)
Kazmi et.al (2017)	1992-2014 Pakistan	GMM	Real GDP	Secondary, Primary, college and university level enrollment.	Each level (+).
Nowak & Dahal, (2016)	1995-2013 Nepal	OLS	GDP	Gross enrollment at Secondary, primary, and tertiary level	Each level (+)
Behrooznia et al., (2016)	1970-2010 40 Asian countries	Panel cointegration technique	GDP	Human capital (enrollment at all levels),	Education (-)
Pegkas (2014)	1960-2009 Greece	VAR	GDP	Secondary, Primary, and higher	Each level (+)
Afzal et al. (2013)	1971-2011 Pakistan	ARDL and causality technique	Real GDP	Education	Education (+)
Afzal et.al (2010)	1970-2009 Pakistan	ARDL	Real GDP	School enrollment	School enrollment (+)

Source: Authors complication

III. Data Description and Methodology

This study used secondary annual time series data ranging from 2002-2020 for both countries. The data have been obtained from the WDI (2021). Primary, Secondary, and tertiary school enrollment gross is used for proxies for education and some other variables namely, inward FDI, GKF, labor force, and Inflation and GDP per capita. Variables details are given in Table 2. The prior studies used different variables along with schooling to investigate the effect of schooling on output growth. Like, Nowak and Dahal (2016) used primary, secondary and territory enrollment for education. Behrooznia et al. (2016) used primary, secondary and territory enrollment for education. This study used the following multivariate regression model, based on the studies of Nowak and Dahal (2016), Behrooznia et al. (2016), Rehman et al. (2018), Azam and Khan (2020), Muhammad and Hussin (2021) and in symbolic form can be written as below:

$$EG_t = \alpha_0 + \alpha_1LFP_t + \alpha_2GKF_t + \alpha_3FDI_t + \alpha_4INF_t + \alpha_5PSE_t + \mu_t \dots\dots\dots(1)$$

$$EG_t = \alpha_0 + \alpha_1LFP_t + \alpha_2GKF_t + \alpha_3FDI_t + \alpha_4INF_t + \alpha_5SSE_t + \mu_t \dots\dots\dots(2)$$

$$EG_t = \alpha_0 + \alpha_1LFP_t + \alpha_2GKF_t + \alpha_3FDI_t + \alpha_4INF_t + \alpha_5TSE_t + \mu_t \dots\dots\dots(3)$$

Where, α_0 is intercept and $\alpha_1, \alpha_2, \alpha_3, \alpha_4,$ and α_5 are coefficient and $\mu_t =$ error term.

Table 2: Data and variables description

Variable explanation	Symbol
GDP per capita growth (annual %)	EG_t
Secondary school enrollment (% gross)	SSE_t
Labor force participation rate (% of total population ages 15+)	LFP_t
Gross capital formation (% of GDP)	GKF_t
Inflation, consumer prices (annual %)	Inf_t
Tertiary school enrollment (% gross)	TSE_t
Foreign direct investment, net inflows (% of GDP)	FDI_t
Primary school enrollment (% gross)	PSE_t

Note: The data of all variables were collected from the World Development Indicators (WDI) (2021) and the data of Gross capital formation (% of GDP) is not available for Afghanistan.

IV. Estimation Strategy

This study employed Augmented Dickey-Fuller (ADF) test formed by Dickey and Fuller (1979) and Phillips-Perron test constructed by (Phillips, 1988) to detect the unit root problem in the data. this study employs the Fully Modified Least Squares (FMOLS) technique to estimate the coefficients constructed by Phillips and Hansen (1990). The FMOLS techniques have better perform than OLS techniques because it deals with the problem of Serial-autocorrelation and endogeneity in the independent variables (Amarawickrama & Hunt, 2008). This study also used Phillips-Ouliaris Cointegration Test to check the cointegration among the variables constructed by (Phillips & Ouliaris, 1990).

V. Results and Discussion

Table 3 presents the PP and ADF tests results. The ADF tests shows that all the variables are stationary at level and have first-degree order of cointegration. Similarly, The PP tests shows that all the variables are stationary at level and have first-degree order of cointegration $I(0)$ except the series of primary school enrollment is stationary at level and has $I(0)$. All the variables have first-degree order of integration; therefore, the FMOLS is the most appropriate technique for estimation in this case. Table 4 presents the

regression results, the FMOLS technique results shows that Labor force participation rate (LFP) has helpful and meaningful impact on GDP growth, in case of Pakistan and Afghanistan. Similarly, the Gross capital formation (GKF) has constructive and meaningful impression on GDP per capita of Pakistan but the data of gross capital formation is not available for Afghanistan. The inward FDI has no consequence on per capita GDP, in case of Pakistan while has constructive and substantial effect on Afghanistan's GDP growth. While the inflation rate has harmful and substantial outcome on Pakistan's GDP growth while has enthusiastic and substantial consequence on Afghanistan's GDP growth.

The PSE has inspiring and substantial consequence on GDP growth in both Afghanistan and Pakistan. Similarly, the SSE has upbeat and substantial outcome on GDP per capita in Pakistan and Afghanistan. The tertiary school enrollment has encouraging and substantial consequence on GDP growth in Pakistan and Afghanistan. Our study results were alike with the outcome of NowakandDahal (2016), Kazmi et al. (2017), Azam and Ahmad (2015) and Afzal et al. (2010) while oppose with the result of Behroozniaetal., (2016). The Philips-Ouliaris cointegration test indicated that there exists the long-run cointegration among the variables. Similarly, the Jarque-Bera test indicated that the residuals of all regressions are normally distributed. Moreover, overall empirical results of this study are matching to the findings of Haseeb et al. (2014), Bakar et al. (2014), Azam (2016; 2017); Behrooznia et al. (2016), Kotaskova et al. (2018), Azam et al. (2019), and Rehman et al. (2020)

Table 3 : Unit Root Tests Results

Country	Variable	ADF (p-value)		PP (p-value)		Decision
		At level	First diff	At level	First diff	
Pakistan	EG _t	-1.8292 (0.3555)	-4.0395* (0.0074)	-2.0695 (0.2577)	-4.0898* (0.0067)	1(1)
	LFP _t	-1.9509 (0.3030)	-2.8051*** (0.0810)	-2.3476 (0.1691)	-5.5947* (0.0004)	1(1)
	GKF _t	-1.4432 (0.5382)	-3.4712** (0.0226)	-1.5837 (0.4700)	-3.4712** (0.0226)	1(1)
	FDI _t	-1.5531 (0.4848)	-3.1642** (0.0406)	-1.7403 (0.3957)	-3.1642** (0.0406)	1(1)
	Inf _t	-2.2663 (0.1922)	-5.0428* (0.0010)	-2.2663 (0.1922)	-5.0489* (0.0010)	1(1)
	PSE _t	-1.4553 (0.5332)	-4.7671* (0.0018)	-1.4471 (0.5363)	-4.7594* (0.0018)	1(1)
	SSE _t	-0.6402 (0.8378)	-3.3734** (0.0283)	-0.5279 (0.8639)	-7.9639* (0.0000)	1(1)
	TSE _t	-2.2956 (0.1836)	-3.3402 (0.0291)	-2.2956 (0.1836)	-3.3285** (0.0297)	1(1)
	Afghanistan	EG _t	1.5745 (0.4732)	-7.0765* (0.0000)	-2.2517 (0.1966)	-12.9368 (0.0000)
LFP _t		-2.7660*** (0.0829)	-4.8061* (0.0016)	-2.77*** (0.0829)	-4.8061* (0.0016)	1(1)
FDI _t		-1.4754 (0.5226)	-4.2081* (0.0070)	-1.4754 (0.5226)	-3.4575* (0.0232)	1(1)
Inf _t		-2.1282 (0.2368)	-7.0959* (0.0000)	-1.9690 (0.2964)	-14.9759 (0.0000)	1(1)
PSE _t		-2.5358 (0.1272)	-3.3231* (0.0300)	-3.7542 (0.0123)	----	1(1) & 1(0)
SSE _t		-1.0751 (0.7017)	-3.0318*** (0.0519)	-1.0540 (0.7099)	-3.0928** (0.0464)	1(1)

TSE _t	1.3170 (0.9973)	-4.8375* (0.0017)	1.1913 (0.9966)	-5.7786* (0.0003)	1(1)
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Note: *, **, & *** are shown the significance level at 1%, 5% and 10% respectively.

Table 4: Regression Results

Equation	Pakistan			Afghanistan		
	(1)	(2)	(3)	(1)	(2)	(3)
LFP _t	0.5525** [0.2438] (0.0427)	0.5844** [0.2006] (0.0130)	0.4700* [0.0593] (0.0000)	0.3193** [0.1191] (0.0189)	0.4182** [0.1653] (0.0251)	0.1902** [0.0745] (0.0238)
GKF _t	0.5727** [0.2475] (0.0392)	0.2820 [0.2095] (0.2031)	0.4175* [0.0674] (0.0000)	-----	-----	-----
FDI _t	-0.1197 [0.4163] (0.7786)	0.1739 [0.3415] (0.6199)	0.1995*** [0.0981] (0.0646)	0.1314*** [0.0665] (0.0697)	-0.1096 [0.1255] (0.3984)	0.2634* [0.0462] (0.0001)
Inf _t	-0.2192 [0.0631] (0.0046)	-0.2421* [0.0516] (0.0005)	-0.2596* [0.0146] (0.0000)	0.1287* [0.0234] (0.0001)	0.1137* [0.0341] (0.0054)	0.0068 [0.0148] (0.6514)
PSE _t	0.1173** [0.0399] (0.0124)	-----	-----	0.0147** [0.0053] (0.0162)	-----	-----
SSE _t	-----	0.1488* [0.0346] (0.0010)	-----	-----	0.0320** [0.0122] (0.0208)	-----
TSE _t	-----	-----	0.0735** [0.0332] (0.0473)	-----	-----	0.3953 [0.0187] (0.0000)
Constant	-24.403*** [12.8944] (0.0828)	-26.049** [10.7710] (0.0324)	-26.951* [3.0516] (0.0000)	17.4839* [5.6529] (0.0086)	22.6148** [8.0003] (0.0143)	12.9925* [3.5863] (0.0031)
Adj. R ²	0.5982	0.6589	0.4359	0.1378	0.1473	0.4652
Philips-Ouliaris tau-statistic	-5.6533*** (0.0530)	-6.1279** (0.0273)	-5.7754** (0.0449)	-6.1691** (0.0124)	-7.0885* (0.0031)	-6.2112** (0.0117)
Jarque-Bera	1.8292 (0.4007)	0.9570 (0.6197)	0.2636 (0.8765)	1.0668 (0.5866)	0.7515 (0.6868)	0.4542 (0.7968)

Note:

- i. The data of gross capital formation is not available for Afghanistan.
- ii. The standard error value is inside the [] and p-value inside the ().
- iii. *, **, & *** are shown the significance level at 1%, 5% and 10% respectively.

V. Concluding Remarks

The most important factor in determining the economic development of a country is education. Moreover, education is indispensable factor of economic development for the developing nations as they are striving hard for improving the efficiency and productivity of their labour force. A good education system not only promotes productivity but also has a positive impact on income and growth. This study examined the effect of schooling on GDP per capita growth of Pakistan and Afghanistan over the period of 2002-2020. For estimation, the FMOLS estimator is employed and Philips-Outliaris tau-statistics is implemented to detect the co-integration among the variables. Furthermore, Jarque-Bera test was applied to check the normality of the residuals. The empirical results reveal that primary, secondary, and tertiary school enrolments have optimistic and substantial effects on GDP per income growth for both Afghanistan and Pakistan. Therefore, it is concluded that education level significantly

contributes to the GDP per income growth of both the countries. However, primary, and secondary school enrolment has been more effective to influence Pakistan's GDP growth than Afghanistan, while tertiary school enrolment has been more effective to influence Afghanistan's GDP growth than Pakistan. Moreover, the residuals of all the regressions are normally distributed and showed long-run co-integration among the variables. The findings of the study have many implications, it recommends that both the countries need to improve education system and focus on provide quality education. Furthermore, special attention of the government is required to the female education in Afghanistan in order to increase school enrolment. Moreover, substantial amount is required to be allocated in budgets for education sector and the policy makers need to design such kind of policies which lead to increase enrolment ratio. In this regard awareness programs on the importance of education need to be conducted throughout the countries. The results indicated that without promoting education, achieving a desirable level of economic growth and development is not possible. Therefore, increasing school enrolment must be the top priority of both the countries in order to raise their productivity and to promote growth. This will definitely result in securing economic and social progress which will leads the countries towards the welfare target.

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