Higher Education and Economic Development in Pakistan: An Appraisal

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Abstract

Higher education is extremely important for a country's prosperity. Higher education is important at all levels of economic growth for various industries. Higher education boosts worker productivity, improves skills, and advances technology. Similarly, higher education is critical to a country's social and political stability. Tertiary education also contributes significantly to the enhancement of the country's level of living. The study is to investigate the contribution of higher education to Pakistan's per capita GDP. This study uses data from 1980 to 2022 and employs ARDL approaches to estimate coefficients, co-integration techniques to examine long co-integration among variables, and ECM to examine adjustment speed. Because the results of unit-root testing are mixed, ARDL approaches are more suited for data approximation. LFP, GKF, GE and territory education have long-term positive effects on economic development eventually. However, Government-spending (GE) has a positive influence on per capita income, while the rest of rest of variables have no effect on GDP in the near run. The study also discovered a long-run link between the variables, with a 52% pace of adjustment. As a result, this study shows that higher-education (later HE) has a favorable impact on Pakistan's economic-development. Due to a lack of data, this study is confined to HE as a whole and does not address the composition of HE. Therefore, the government should prioritize HE to boost Pakistan's economic development.

Keywords: Higher education; Pakistan; ARDL; Economic Development; ECM.

Background of the Study

Background of the Study

The accumulation of human capital (HK) data is the essential tool of progress, and inequalities in Human Capital are the primary foundation of variances in incorporate ethics across nations. Physical capital has an essential but clearly secondary function.(Lucas, 1988). Higher education is widely acknowledged as a vital tool for stimulating economic growth.

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It demonstrates a dynamic role in developing social capacities and accelerating economic progress through various means such as services and information, among others. Education's return is not restricted to the rural; everyone benefits from it. For long periods of time, Pakistan placed immense strain on both elementary and secondary education. However, they overlooked Higher Education as a source of cash to boost ED. The link between HE and economic development (ED) has been debated since ancient Greece. Some ancient economists, such as Adam Smith, emphasized the need of investment in social services (Aziz et al., 2008). HE may increase tax income, increase savings and investment, and create new business and government leaders. It will also increase a state's might; it will support condensed population growth, advance in knowledge, and produce greater power (World Bank, 2011).

As a result, policymakers are becoming increasingly aware of the critical link between tertiary education efficiency and national income. Legislators seek to ensure that money is spent and spent sensibly. For example, the state proposes for vocations that will stimulate the economy in the prospect; they are looking for postsecondary education to grow, and for these positions, a location is created that is required. As a result, several governments are planning postsecondary education strategies as a policy weapon. Certainly, a country may benefit from wise investment in its social riches. When all countries have the opportunity and resources to succeed in the educational system, the country obtains the benefits of a productive society. A well-educated populace helps to refine the country's economy and future labor force requirements. Higher education has usually been regarded as a profit for everybody, but a well-educated society benefits the country. Which is the eventual source of the link between tertiary-education and economic-progress (Bell, 2011).

Similarly, according to contemporary growth theory, capital production has a progressive influence on ED. While, HK has a progressive impact on ED (Gyimah-Brempong et al., 2006). While the gathered studies on growth suggest that HE has a positive influence on ED. Certain academics question the importance of economic development and research as a foundation for advancement (Hall & Jones, 1999), Others argue that basic education is the key source of GDP in developing nations (McMahon, 2002; Petrakis & Stamatakis, 2002). If scholastic achievement in nations rises with affluence, it is not surprising that HE becomes more crucial for the GDP growth route as income rises (Gyimah-Brempong et al., 2006).

In our day and age, rational resources have become a symbol of rapid economic progress, and higher education has become a tool for polishing social or rational resources. Higher education oversees producing intellectuals, researchers, experts, modernizers, and responsible citizens in a country. HE gives opportunities for societal flexibility and improved living ethics. As a result, the duty of HE is more important for developing or undeveloped countries like Pakistan to accomplish swift and sustainable GDP growth. Higher education not only raises economic growth, but it

also increases productivity when the labor force is educated which also increases government expenditure, per capita income, and capital formation. The impact of higher education on ED in Pakistan. This research, however, only looks at HE.

Higher education can be perceived as a crucial involvement in GDP and ED through encouragement invention and increasing higher skills. In other endogenous-growth theory Arndt et al. (2010) and Romer (1990), knowledge is clearly concerned to R&D. According to the report, HE has a favorable and long-term impact on all sectors of Pakistan. HE has an impact on the labor force, capital formation, government spending, GDP, and so on. Higher education is critical to a country's GDP growth. Higher education is valuable at all levels of economic growth for various industries. No doubt, Pakistan is faced with internal and external security threats and major chunk of the national exchequer is spending on security of the country (Khan, Jaspal & Yasmin, 2017) which affects human security in Pakistan especially social sector.

Higher education boosts worker productivity, improves skills, and advances technology. Similarly, higher education is critical to a country's social and political stability. HE also plays an essential role in raising the country's level of living. Dufrechou (2016) researched the link between higher education and GDP and discovered that more educated individuals accelerate GDP and explain cross-country disparities in per capita income. In practice, the result is also pertinent considering the sample nations' growth in higher education successes and the varied degrees to which their labor markets have been able to efficiently absorb this highly trained people capital.

Aziz et al. (2008) confirms that the returns on HE have a favorable influence on Pakistan's GDP. Higher education enrollment and expenditure both have a beneficial influence on GDP. Furthermore, higher education investment and GDP have a beneficial influence on higher education enrolment. It is widely agreed that an increasing proportion of more educated people can result in favorable economic returns for countries seeking to maintain up with or catch up with the most sophisticated cultures. However, for this HK to be efficiently translated into a more beneficial and efficient work force, a society requires a variety of labor market and institutional circumstances.

This study differs from the others in that it examines the link between HE, GE, LFP, and ED in the presence of GKF. The current study employed the most appropriate methodology, ARDL, to assess the relevance of the outcomes. There is no study in Pakistan that demonstrates the relationship between HE and ED in the presence of such crucial variables as GE, LFP, and GKF. The current study adds to the body of research that investigates the comprehensive relationship between HE, ED, LFP and government spending in Pakistan. As a result, this research will be more valuable to the Government of Pakistan, Pakistan's HEC, and policymakers in promoting higher education in Pakistan.

Review of Literature

According to the Human Capital (later HK) Theory, education increases an individual's productivity through developing expertise and capacities. As a result, a country with a bigger human capital stock should have a higher national production. (Brewer & McEwan, 2010). In the arrow-model, the "learning via practice" approach is utilized and the development of HK. It is because learning by doing reduces the amount of labor required to produce a unit of output. (Spear & Young, 2016).

Higher education plays a substantial part in every country's economic growth and is accountable for its progress toward accomplishment. According to Schultz (1961), education is the most important element determining a state's economic progress. He stated that education is a fundamental and critical component of economic development and growth strategy. Education is extremely important in the building of social wealth. The findings indicate that higher education has a progressive and direct impact on a country's productivity and prosperity. Laborers with a good education may help the country succeed and grow.

According to Keller (1983), there is a strong progressive link between ED and HE. When a country's education system is well developed and strengthened, that country will be economically powerful. He went on to say that secondary education has an optimistic impact on a state's economic development. Dreze and Sen (1999) discovered that two factors contribute to a state's economic development: education and health. A country's economic development may be maximized if it has a stronger education system and a healthier work force. Krueger Jr et al. (2000), discovered that improving a country's education system leads to an improvement in the country's economic strategy, resulting in improved economic development.

Bils and Klenow (2000) utilized data from 1960 to 1990 using OLS methods to estimate the data and found that a high enrolment rate in higher education had a considerable effect on a country's economic development. Adamson et al. (2003) estimated the model using an 80-country criminal data from 1960-1990 and OLS methods. The usage of this measure of HK accretion revenues has a optimistic but minor relationship with per capita GDP growth in cross-country panel regressions. Gylfason and Zoega (2003) estimated panel data from 1965 to 1998 using apparently unrelated regression (SUR) approaches and showed that education had a beneficial influence on ED. Self and Grabowski (2004) used Granger Causality to data from 1966 to 1996 in India. They concluded that education in each area had a substantial impact on GDP. Lin (2004) explored the influence of HE on LFP and then GDP in Taiwan from 1965-2000 and discovered that HE has a substantial influence on Taiwan's economic development.

Francis and Iyare (2006) employed VECM in the Caribbean using yearly data from 1964 to 1998 and concluded that there is a near-run link between higher education and economic development. HE has no long-term association with income.

Chaudhary et al. (2009) examined data from 1972 to 2005 and found a link between tertiary education, LFP, and ED. In the instance of Nigeria, Dauda (2010) used data from 1997 to 2007. They used co-integration and (ECM) estimation approaches and discovered a substantial and significant association between government spending on education, economic development, and gross capital creation. Magoutas et al. (2011) utilized panel data from 93 nations over a 28-year period (from 1960 to 1987) and concluded that higher education and economic development had a strong association. Furthermore, if a country does not invest in education, its economic growth would be slow, and vice versa. Similarly, Dudzevičiūtė and Šimelytė (2018) used time series data and the ganger causality test approach to analyze the link between HE and production growth in certain European Union states from 1997 to 2016. Their findings suggest that only France, Belgium, Ireland, and the United Kingdom demonstrate a causal association between HE and ED. While in the remaining states, higher education participation did not rise and had no effect on ED.

Rehman et al. (2018) used data 1999-2015 for the three Central Asian nations (CAN) of Kazakhstan, Kyrgyzstan, and Tajikistan and found that GKF and HK has positive effect on ED. Donou-Adonsou (2019) used penal data from 45 (forty-five) Sub-Saharan African (SSA) countries from 1993-2015, and found that HE has a significant impact on ED in these countries. Maneejuk and Yamaka (2021) use data of ASEAN-5 nations from 2000 to 2018. According to their findings, secondary school enrolment has a significant and favorable influence on GDP, but HE is the primary future for development and sustainability. Agasisti and Bertoletti (2022) used the data set from 2000-2017 of European regions and the increase in the number of universities has great effect on economic growth. Almutairi (2023) used ARDL technique to estimate the date 1990 to 2019 of Saudi Arabia and found that HE has negative effect on GDP.

literature Review in case of Pakistan

Chaudhary et al. (2009), discovered a positive link between HE and ED using data from Pakistan from 1972 to 2005 and the Johansen Co-integration and VAR methodology. Afzal et al. (2012), utilized ARDL algorithms to estimate data from 1971 to 2010 in Pakistan. They discovered that there are beneficial links between higher education, economic progress, and poverty. examine the link between HE and ED in Pakistan from 1980 to 2011 and found that HE has a positive influence on GDP. Ali et al. (2016) employed the causality test and co-integration test in Pakistan from 1982 to 2014 and discovered that HE enrolment had a positive influence on GDP. Khan et al. (2022) investigate the influence of education on GDP per capita growth in Pakistan and Afghanistan from 2002 to 2020, using the FMOLS approach for estimate. The study's empirical findings demonstrated that elementary, intermediate, and tertiary school enrollments had an inspirational and astonishing impact on GDP growth in both Afghanistan and Pakistan. This study revealed that education had a considerable impact on GDP development in both Pakistan and Afghanistan.

Eventually, however, elementary, and secondary school enrolment in Pakistan has been more effective than in Afghanistan, while tertiary school enrollment in Afghanistan has been more effective than in Pakistan.

Table 1: Summery of empirical literature

S. No	Author	Area (period)	Methodology	Dependent variable	Relationship
1.	Sarwar and Hayat (2021)	Pakistan (1996-2017)	two stage least square 2SLS Regression analysis	GDP	Positive
2.	Buari et al. (2020)	Nigeria (1980-2017)	OLS	GDP	-do-
3.	Kobzev Kotásková et al. (2018)	India (1975-2016)	co-integration	GDP	-do-
4.	Oancea et al. (2017)	Romania (1980-2013)	VECM	GDP	-do-
5.	Wang and Liu (2016)	Group of countries (1960-2009)	OLS	GDP per capita	-do-
6.	Nowak and Dahal (2016)	Nepal (1995-2013)	co-integration and OLS	Gross Domestic Products	-do-
7.	Ali et al. (2016)	Pakistan (1982-2014)	Ganger Causality Test	GDP	-do-
8.	Qazi et al. (2014)	Pakistan (1980-2011)	ARDL	Real GDP	-do-
9.	Afzal et al. (2012)	Pakistan (1971-2010)	ARDL	Real GDP	-do-
10.	Afzal et al. (2011)	Pakistan (1971-2009)	ARDL	RGDP	-do-
11.	Akpansung and Babalola (2011)	Nigeria (1977-2007	Two-Stage Least Squares (TSLS)	GDP	-do-
12.	Chaudhary et al. (2009)	Pakistan (1972-2005)	Johansen Co-integration and VAR	GDP	-do-
13.	Islam et al. (2007)	Bangladesh (1976-2003)	co integration test	Index of real GDP	-do-

Methodology

This research uses data from 1980 to 2022 and collected from World Development indicators (2023).

Model Specification

This study uses the following altered model, which also used by Rehman et al. (2020), Rehman et al. (2018) and Khan et al. (2022).

Description of Variables

Table 2: Description of variables

S. No	Variables	Symbols	Measurement
1	GDP per capita (Annual%) substitution for ED	ED	Percentage
2	Gross capital formation	GKF	Percentage
3	Labor force (as %age of total-population)	LFP	Percentage
4	Government Expenditure (%age)	GE	Percentage
5	Higher school enrollment (%age)	HE	Percentage

Econometric Techniques

The Autoregressive Distributed Lag (ARDL) procedure is more appropriate for the mixed integration level.

Results and Discussion

Unit Root Test Results

The results of unit root testing are shown in Table 3. ADF and PP tests were utilized in this study to confirm the sequence that the series ED is stable at level, implying a zero-, (1(0)), but the remaining series are stationary at 1st-difference, implying a 1st-degree order of integration (1(1)). According to the unit root test findings, the level of integration of the variables is jumbled. As a result, the data's behavior suggests that ARDL approaches be used to estimate the coefficients of the variables.

Table 3: Unit Root tests Results

Variables	ADF test (P-values)		PP test (P-values)		Order of Integration
	At level	1st Difference	At level	1st Difference	
Y_t	-4.7662*	---	4.7346*	----	I (0)
	(0.0004)		(0.0004)		
K_t	-2.0749	-6.5759*	-2.1764	-6.5857*	I (1)
	(0.2554)	(0.0000)	(0.2176)	(0.0000)	
LF_t	-2.9296***	-11.6789*	-2.7379***	-11.7968*	I (0)
	(0.0504)	(0.0000)	(0.0762)	(0.0000)	
GE_t	-1.7737	-6.9822*	-1.7455	-6.9885*	I (1)
	(0.3881)	(0.0000)	(0.4017)	(0.0000)	
HSE_t	1.5541	-4.8919*	1.0875	-4.9491*	I (1)

	(0.9992)	(0.0003)	(0.9968)	(0.0002)

Note: (a) The symbols *, **, and *** denote the level of implication at 1%, 5%, and 10%, respectively.

Regression Results

Table 4 describes the long-period results. The ARDL approach results show that LFP has a positive effect on ED. The results are in line with Metcalf et al. (2005), Khilji (2005), Rehman et al. (2018) and Rehman et al. (2020), while dissimilar with Kneller et al. (1999). Similarly, the GKF also had a positive effect on ED. The similar outcome were by Rehman et al. (2018), Gyimah-Brempong et al. (2006), and Rehman et al. (2020), while, incompatible with Devarajan et al. (1996).

Higher-education has positive effect on ED. Similar, results were given by Lin (2004) ,Cohen and Soto (2007), Kakar et al. (2011), Levchenko et al. (2017), and Kotásková et al. (2018) while, Bose et al. (2007). Similarly, GE has a positive effect on ED. The outcome is alike with Afonso and Alves (2017), and Rehman et al. (2020), while, Shah et al. (2016), and Najarzadeh (2019). A percent increase in the LFP, GKF, GE and HE will bring an increase in the GDP per capita income by 0.27%, 0.78%, 0.52% and 0.87% respectively. Furthermore, the ARDL Bound test demonstrates that the variables have a long run association.

Table 4: ARDL Long-Term Results

Variable	Coefficient	Standard Error	t-statistic	Probability
GKF_t	0.782**	0.299	2.613	0.019
LFP_t	0.271**	0.120	2.261	0.038
GE_t	0.525*	0.136	3.860	0.001
HE_t	0.875***	0.492	1.779	0.094
ARDL Bound Test Results		F-Statistics	12.1949*	
Critical Value Bounds		Significance level	I0 Bound	I1 Bound
		10%	2.450	3.520
		5%	2.860	4.010
		1%	3.740	5.060

Note:*,**, and *** reflect the level of importance at 1%, 5%, and 10%, respectively.

Short-Run and ECM Results

Table 5 displays the short run and ECM findings.

The GE has a positive effect on ED, while the rest of variables have no effect on GDP per capita. The ECM result shows that the pace of correction from near to long run equilibrium is 52%.

Table 5: Short-Run and ECM Results

Variable	Coefficient	Standard Error	t-statistic	Probability
ECM_{t-1}	-0.525*	0.052	-10.171	0.000
$D(GKF_t)$	-0.170	0.170	-0.999	0.325
$D(LFP_t)$	-0.034	0.066	-0.522	0.605
$D(GE_t)$	0.498*	0.080	6.261	0.000
$D(HE_t)$	-0.139	0.362	-0.384	0.703
C	0.0580	0.184	0.314	0.755

Note: *, **, and *** reflect the level of importance at 1%, 5%, and 10%, respectively.

Conclusion and Recommendations

The purpose of the study is to investigate the contribution of higher education (HE) to Pakistan's ED. The data from 1980 to 2022 were utilized in this work, and ARDL techniques were used for estimation. Labor force participation (LFP), gross capital formation (GKF), government expenditure (GE) and higher education (GE) have a positive effect on economic development eventually. However, only government expenditure has a positive effect on economic development in the near run. As a result, this study showed that higher education (HE) had a favorable contributed to Pakistan's economic development. This study concluded that higher education is the most essential component in Pakistan's economic growth; so, the government should prioritize higher education to promote Pakistan's economic development.

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