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Research Article

Impact of Education Expenditure on Economic Growth: A Study of Selected ECO Countries

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Abstract

The relation between spending on education and economic growth has been a popular subject of research, where education as a human capital is an important aspect of human capital in the long-term development. This paper looks at how education expenditure affects the economic growth of some ECO nations from 1972 to 2014. Other macroeconomic variables like the participation of the labor force, household consumption, and foreign remittances are also factored in alongside education in order to have a holistic picture of their effects on growth. The secondary data has been used to analyze it, and the sources are reliable, such as the Pakistan survey, the WDI, and the SBP. The augmented Dickey-Fuller test was initially applied to test stationarity since time series data tend. Once the integration sequence of the variables had been verified, two sophisticated econometric tools were used, that is, Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS). Such approaches are especially appropriate because they address the problems of endogeneity and serial correlation, giving superior estimates of both long-run and short-run relationships between education spending and economic growth. The results indicate that the positive and statistically significant effect of the expenditure on education on the economic growth is positive. It was also discovered that labor force participation has a positive influence on growth, implying that the higher the participation in productive work, the higher the economic output. Household final consumption spending and foreign remittances, on the other hand, harmed economic growth. Overuse lowers savings and investment, which are essential in long-term development. It is time that policymakers focus on investment in education, promote higher levels of participation in the labor market, and implement other policies to redirect remittances and consumption towards productive investments to achieve long-term growth.

Keywords: Education expenditure, FMOLS, DOLS, Economic growth, Remittances.

Introduction

A key component of economic prosperity is education. Numerous economists have proposed theories of economic growth, including Adam Smith, Romer, Lucas, and Solow. Economic growth and human capital are thought to be significantly influenced by education. The performance of the organization and the economy is enhanced by education's beneficial effects on poverty alleviation, economic growth, and human capital engagement in education for Economic Growth. Higher education spending translates into more human capital, which raises production. Changes to the nation's educational requirements, curriculum analysis to optimize technology innovation, and workforce specialization all contribute to economic success. The impact of education spending on economic growth in a few ECO nations—Pakistan, Iran, and Turkey—was the main emphasis of this study. Spending on education has a positive societal impact. The goal of the current study is to determine how growth and education spending are related. According to the study, it has a favorable impact

on economic growth. Through professionals who can help increase any nation's growth rate, literacy rates, education, and skills. Based on their advancements in education and talent, the developed nations achieve impressive progress. We will examine a wide range of topics in Education, Society, and Development, including economic growth and education. Any nation's economic development is directly impacted by education. The goal of increased earnings, outputs, and growth can be achieved with the support of education, which offers a ladder to improve people's skills. Educated farmers adopt a logical approach to any production, and their sense of reason will lead to greater productivity. It is indisputable that educated and skilled individuals are a crucial component of long-term economic success.

The curriculum is reoriented in accordance with the real resource needs of the nation. Investment in human capital, like education, enables every person to participate in production in society. Education creates such an atmosphere in the country in which to achieve the capacity of the economy high level of economic growth, high wages, and strong social unity. In economic development, education works in two ways: division of tasks and performance of production. Schools are a part of these grand tasks that will create trained persons and effective performance efficiency of labor, which judges the performance of the economy. In this sense, the impoverished countries are also exerting pressure to improve their educational standards in order to significantly contribute to their economic development. Professor Harbosan asserts that the culmination of a country's wealth is its human resources. Humans are the active forces that create social, economic, and political organization, gather capital, exploit natural resources, and propel country growth. Capital and natural resources are the passive factors of production. A country cannot advance if its residents' skills and expertise are not trained and effectively utilized in the national economy. Zogjani et al. (2024) shows the effect of public education spending on Kosovo's economic expansion. The author used time series data from 2012-2022 and the CBPF model. The results explore that public expenditure on education positively and significantly contributes to Growth (Najaf-Zada, 2024). The Relation between Education Spending and economic growth. The author used the data from 2015 to 2019 and model used panel regression analysis. The author found that one percent increase in secondary Sector spending that lead .76 % increase in RDGP per capita growth. While primary spending shows no significant effect.

Gheraia et al. (2021) also use the ARDL model. The results show that a one percent expenditure led 89% increase in GDP, and 1% increase in expenditure corresponds to a 0% increase in domestic production volume. Yakubu and Akamegbu (2015) investigated the education expenditure and economic growth in 2010 and used the multiple regression econometrics technique. The researcher used VECM) to estimate the parameters. TGVTE, REDEXP, and PRYSE were the independent variables in the study, whereas RGDPG was the dependent variable. According to the study, enrollment will rise in northern Nigeria as a result of rising living standards and deterring child marriage. Tamang (2011) employed time series and secondary data from 1980 to 2008. The premise of data stationarity was tested using the ADF test, and the Long-term link between the two variables was determined and tested in Johansen's works. According to the study, there is 0.28 percent increase in GDP of labor for every one percent in substantial capital per labor. The analysis discovered a positive correlation between GDP and education spending. An endogenous growth model was employed in the study. GDP was the dependent variable in the study, along with RGDP, capital, labor, and educational spending. The OLS and Johenson co-integration test and the Phillips-Perron test were employed in the investigation. Afzal et al. (2010) explained the relationship between school education & economic growth in Pakistan. The Author used the data from 1970-71 to 2008-09. The data in this study were obtained from the economic survey of Pakistan, the Labor Force Survey, and the SBP annual reports. The researcher examined growth. The regression model used in this study. The ARDL technique was used. The researcher suggested some policy recommendations.

Riasat et al. (2011) investigate the impact of educational expenditures on economic growth, evidence from Pakistan. The study used data from 1972 to 2010. The study found a positive relationship among the variables. The researcher explained variables like RGDP, physical capital, number of workers, and human capital. The study used the ARDL technique to estimate OLS. The researcher suggested some policy recommendations. Idrees and Siddique (2013) used cross-sectional data from 1990 to 2006. The data used 7 developed countries

and seven developing countries. The study claimed that education is good for better development. The study prefers social benefits over private benefits. The researcher used Pedroni's residual–based panel cointegration test. The researcher used the GDP as the dependent variable and total public expenditure on education in the Education section. Hussain et al. (2012) suggest major center of attention of the study is the association between education expenditure and economic growth. Researchers used RGDP as the dependent variable and EDU, Fixed CF, and Labor Force participation as independent variables. The study used the Phillips-Perron (PP) test and used the VECM technique. Sinha (1998) explained data from 1950 to 1992 and the Penn World Table data. The researcher used the ADF and Johenson Co-integration test. The study focused on three main elements: first, unit root properties of the variable, second, testing whether a long-run link existed or not, and third, causality among the variables. Mercan and Sezer (2013) inform that only two variables, RGDP & education, are used. After the ADF test's verification of the data's stationarity. The ARDL, ECM, and unconstrained error correction model (UECM) for the long-term connection. The findings demonstrated a substantial and positive correlation between the factors.

Arpaia and Turrini (2008) examine short-term adjustment and long-term trends in government spending and economic growth in the EU. The study employed a sample of EU-15 nations and time series data from 1970 to 2003. Examining the long-term and short-term relationships was the primary goal of the study. Potential output was employed as a variable, and the stationarity of the ARDL approach was examined using the ADF test. The researcher discovers a meaningful and long-lasting relationship. Reza and Valeecha (2012) investigated how education affected Pakistan's economic expansion. The time series data (1981-2010) was used by the researcher. The researcher wants to find out how education affects economic growth. The analysis makes use of the following variables: real GDP, labor force participation, government spending on education as a percentage of GDP, and the Rate GPCF. Techniques for autocorrelation, heteroscedasticity, and multicollinearity were applied. Because of the small sample size (less than 30), the study concluded that there is no short-term association between the variables, but that there is a long-term relationship. Mercan (2013) investigated the connection between Turkey's economic growth and educational spending. Approach to bond testing. Cross-sectional data from 1980 to 2012 were used by the economist. The World Bank was the source. The researcher's primary goal was to determine the connection between economic growth and education spending. To verify the stationarity, the researcher employed the ADF and Phillips-Perron unit root test. Co-integration analysis and Granger causality analysis were applied. To put the bond test method into practice, an unlimited error correction model was created. The variables of GDP, education, and education spending are employed.

Mallick et al. (2016) investigated how economic growth in key Asian countries was impacted by educational spending. Economic analysis-based evidence. Balanced Panel data from 1973 to 2012 was used by the researcher. The study's primary goal is to determine how education and economic growth are related. The model for panel vector error correction was employed. The factors used in the study include GDP, spending, and education. This demonstrates the variables' beneficial and noteworthy influence. Egbetunde and Fasanya (2013) used the Auto-progress Distributed log Specification to examine public spending and economic growth in Nigeria. Examining was the researcher's primary goal. Both the short and long-term associations between public spending and economic growth were examined using the ARDL technique. The OLS approach will be employed, together with the Johansen-Juselius co-integration, to verify the link. The variables that were employed were the GDP, government expenditure, total capital expenditure (TCAP), and total recurrent expenditure (TREL). The study found a significant result in the long-run relationship. Kunu and Basar (2015) studied the effect of public expenditure on economic growth. An Empirical Analysis for Turkey. The study used the time series data from 1970 to 2012. The study's main aim is to investigate the magnitude of public expenditure, such as education, on the Turkish economy. The study used the (ARDL) to find the relationship between the variable unrestricted error correction models (UECM). The study used real GDP, health spending, education, defense spending, public investment spending, and current spending as variables, and the study used four dummy variables to represent the political uncertainty in the different periods, such as 1980, 1994, 2001, and 2009.

Public spending components of Kenya's economic growth from 1964 to 2011 are examined by Muthui et al. (2013).

Examining how public spending affects economic growth is the study's primary goal. To analyze the data, the researcher employed a vector error correction model, a stationary task, a causality task, and a co-integration task. The study's independent variable was GEPGDP, and its dependent variable was GDP. Islam (2014) shows that economic growth is significantly influenced by education. The study's primary goal was to investigate the connections between the various variables. The ADF was used for the stationary, while the Granger causality task and error correlation model were employed as techniques. The factors have a significant and positive association with one another. Yousif investigated the relationship between economic growth and education spending: some empirical data from the GCC nations. Time series data from 1977 to 2004 were used by the author. The purpose of the study was to investigate the type and direction of the relationship between the economic growth of six GCC nations and their educational spending. The Granger causality task with an error correlation model is used in the study. The study made use of the Perron-Phillips and ADF models. Human capital and GDP are employed as variables (Chipaumire et al., 2014). Keynesian macroeconomics and the traditional long-term link between the variables in South Africa were the main subjects of the study. ADF and Phillips-Perron tests to check the stationarity of the data; both tasks prove that the long-run relationship exists. The study used the GDP as a dependent variable, where M is the real money supply and investment in the economy.

Olabisi and Oloni (2012) noted that low expenditure on education reduced the possibility of market factors. The time series data applied to 1960 to 2008 used GDP, gross Capital formation, government expenditure, RGDP and time series data applied was the vector autoregressive model (VAR). Public expenditure has a positive impact on me on economic growth. Ohwofasa et al. (2012) explored the impact of government expenditure on economic growth in Nigeria. The data range was 1986 to 2011. Parsimonious Error Correction Model. The analysis process was based on Johnson's co-integration technique and the error correction method. The results indicate the long-run relationship between the variables. The researcher found that there is a positive correlation between expenditure on education with different lags and GDP in Nigeria. The researcher proposed that the government spending on Education, particularly on the capital aspect, should be enhanced to enhance Growth.

Objectives of the Study

The primary objective of this study is to explore the relationship between human resources and education, emphasizing their crucial role in economic and social development. The study aims to profile the educational landscape of developing countries that form the focus of our analysis. This includes examining government spending on education, enrollment levels, literacy rates, dropout trends, the cost of education, income disparities, and gender gaps in access to education. Another key objective is to analyze the economics of education, particularly the factors that influence the supply and demand for schooling opportunities. The study will evaluate the costs and benefits of both private and public investments in education, assessing how these investments impact overall economic performance and human capital formation. Furthermore, the research will investigate the broader intersection of development, society, and education. It will cover critical themes such as poverty, educational inequality, economic development, brain drain, internal migration, women's education, child health and fertility, and rural development. The study also seeks to examine the effectiveness of various educational policies and their long-term implications for sustainable national progress.

Methodology

Secondary data was employed in the study. The time series data utilized for variable estimation spans the years 1972 through 2015. The data sources include the survey of the chosen nations, which are members of the Economic Cooperation Organization, central banks, and data gathered by WDI. Education spending is a focused variable that is used to assess how it affects economic growth, along with other variables like GDP (gross domestic product) and HFCE (household final consumption expenditure). Growth is a critical component of any nation's economic success.

Concept of Variables

For the determination of the impact of education expenditure on the economic growth of selected ECO countries, variables are GDP per capita (constant LCU), gross fixed capital Formation, Remittance, EduExp1(Government Expenditure on Education, total % of GDP), HFCE (Household Final Consumption Expenditure), and LFP (Labor Force Participation).

The specifications of the model of the current study are given below:

$$\text{Ln (GDPPC)} = \beta_0 + \beta_1 \ln (\text{GFCF}) + \beta_2 \ln (\text{REMIT}) + \beta_3 \ln (\text{LFP}) + \beta_4 \ln (\text{EduEX1}) \quad (1)$$

Where

Ln = Natural Logarithm

GDPPC = Gross Domestic Product Per Capita

GFCF = Labor Force Participation

EduExp1 = Government Expenditure on Education, total % OF GDP

Remittance = Foreign Remittance

The above variables are used in this model because they have a lot of importance and hypothetical and pragmatic evidence. The description of these variables and the hypothetical impact are under:

Log-log Model

We used the log-log model because we follow the Cobb-Douglas production function, and growth is our output. Previous works (Tamang, 2011; Hussain et al., 2012; Mekdad et al., 2014) used a production function to attempt the determine the impact of education expenditure and economic growth. This can be presented as:

$$Y = A.K^{\beta_1}. L^{\beta_2}. H^{\beta_3}. R^{\beta_4} \quad (2)$$

"A" stands for technological advancement, "K" for capital stock, "L" for labor force, "H" for human capital, and "Y" for output. R stands for remittance. "E," where "E" stands for government spending on education, can be used in place of human capital. We can rewrite the equation as follows by substituting "E" for "H":

$$Y = A.K^{\beta_1}. L^{\beta_2}. E^{\beta_3}.R^{\beta_4} \quad (3)$$

The econometric model is developed using equation (2) above to ascertain how education spending affects economic growth. The following non-linear model is a suitable model to explain equation (2) in accordance with statistical economics and economic characteristics:

$$Y = A\ (CAP^{\beta_1} LAB^{\beta_2}\ EDU^{\beta_3}\ REMIT^{\beta_4}\ ) \quad (4)$$

Y = Output (Real Gross Domestic Product Per Capita), EDU Government Expenditure on Education, GFCF (Gross Fixed Capital Formation), LFP (Labor Force Participation)

Above-mentioned equation, the nonlinear model parameters are β_0, β_1, β_2, β_3, β_3 are not unswervingly estimated. So, it is suggested to modify the production function into a log-linear model.

$$\ln(\text{GDPPC}) = \beta_0 + \beta_1 \ln (\text{GFCF}) + \beta_2 \ln (\text{REMIT}) + \beta_3 \ln (\text{LFP}) + \beta_4 \ln (\text{EduEX1}) \quad (5)$$

Where

ln = Natural Logarithm

GDPPC = Gross Domestic Product Per Capita

GFCF = Gross Fixed Capital Formation

LFP = Labor Force Participation

EduExp1 = Government Expenditure on Education, Total % of GDP

Remittance = Foreign Remittance

The above variables are used in this model because they have a lot of importance and hypothetical and pragmatic evidence.

Johenson Fisher Panel Cointegration Test

After applying the Johenson Fisher Panel Co-integration test. We use Panel co-integration because the data consists of three countries, and the study used the Panel Fully Modified Least Squares (FMOLS) test for the consistency and the long-run relationship among the variables.

Hypotheses are as follows:

Ho = Null Hypothesis

H1 = Alternative Hypothesis

Ho = $\beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_3$ No Long run Relation Contrarily

Ho $\neq \beta_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_3$ a long run relatuon exist

Results and Discussion

To estimate the results of co-integration, this chapter allocated several elements. Firstly, inspect ADF (1979) for time series data, the Augmented Dickey-Fuller test to check the stationarity of the data, and the unit root for estimation. Secondly, the study used the Panel Cointegration TEST for estimation to find the long-run relationship among the variables. Lastly two models for the estimation first one is (FMOLS) Panel Fully Modified Least Squares model and the second model used in the current study is (DOLS) Panel Dynamic Least Square model used for the result.

Unit Root Test

We apply the unit root test, the Standard Augmented Dickey-Fuller test, to check the stationarity. The ADF test is used for the purpose of co-integration of the variables. In the stationary, three types are used: the first one is constant, the second one is constant and trend, and the third one is none. The five variables, GDP growth, Education expenditure 1, GDP per capita GFCF (gross fixed capital formation), LFP (labor force participation), are stationary at level I(0), and other variables, such as EDUCEX2, EDUCEX3, are stationary at I(1). The study summarizes unit root test statistics, and the table consists of two types: one is the data is consists of the stationarity at the level, and the second table shows the stationarity of the data at first difference. So, we draw the table separately at the level and the first difference. The following table abbreviations are: A for Levin, Lin & Chut*, B for Im, Pesaran, and Shin W-stat, C for ADF- Fisher Chi-square, and D for PP-Fisher Chi-Square.

Table 1. Unit root testing (at level)

Variables	Tests	Individual Intercept	Individual and trend	Intercept	None
EDUCEX1	A	17.5248 0000	-23.3300 0000		-2.56491 .0052
	B	-25.0162 0000	-29.6136 0000		
	C	47.2823 0000	279.183 0000		24.7315 0004
	D	54.1256 0000	153.730 000		5.304001 .5055
GDPPC	A	47.3767 1	304.063 (1.0000)		4.14698 (1.0000)
	B	.64736 .7413	-1.94758 .0257		
	C	13.4613 .0363	15.2784 .0182)		1.27661 (0.9729)

	D	27.4466 .0001	271.061 0000	264.572 (0.0000)
HFCF	A	-0.61168 (.2704)	-0.34612 (.3646)	-.28066 (.3895)
	B	-.77862 (.2181)	0.27035 (.6066)	
	C	7.32974 .2914	4.33461 .6315	4.03039 (0.6726)
	D	9.00076 .1735	4.20393 .6491)	5.58373 (0.4714)
LFP	A	-3.21219 .0007)	-3.98684 0000	0.05152 (0.5205)
	B	-4.13613 0000	-4.31771 0000	
	C	28.8635 .0001)	28.7811 .0001)	2.10973 (0.9093)
	D	19.3676 (0.0036)	15.8760 (0.0144)	3.39723 (0.7576)
LNEDUEXP1	A	-145.186 0000	-174.562 0000	-1.10049 (.1356)
	B	-107.840 0000	-132.269 0000	
	C	33.1739 0000	272.571 0000	8.19504 (0.2242)
	D	39.1640 0000	107.280 0000	4.32296 .6331
LNGDPPC	A	-3.45269 (0.0003)	-14.0677 0000	4.67010 (1.0000)
	B	-22.2698 0000	-23.5884 0000	
	C	19.2681 .0037	266.648 0000	0.45311 (0.9984)
	D	84.5912 0000	327.451 0000	4.15846 .6552
LNHFCE	A	-0.44211 (.3292)	-0.20818 (.4175)	-0.10807 (0.4570)
	B	-0.62801 (.2650)	0.38057 (.6482)	
	C	6.57488 .3620	4.00688 .6757	2.97912 .8115
	D	8.51033	3.94556	4.23154

		.2030	.6840	0.6454
LNREMIT	A	0.01898 (.5076)	-4.28162 0000	-1.33763 .0905
	B	0.13959 .5555	-5.552303 0000	
	C	3.78859 0.7053	70.7285 (0.0000)	9.46928 (0.1489)
	D	3.97493 0.6801	16.7157 (0.0104	9.50002 (0.1473)
REMITANCE	A	-0.51374 (0.3037)	-1.47954 0.0695	-2.12816 (0.0167)
	B	-0.91023 (0.1814)	-4.59087 0000	
	C	8.52408 (.2022)	41.4491 0000	13.0783 (0.0418)
	D	15.6507 (0.0158)	24.2226 (0.0005)	20.2899 (0.0025)

Table 2. Unit root testing (at 1st difference).

Variables	Tests	Individual Intercept	Individual and trend	Intercept	None
EDUCEX1	A	-80.8622 0000	-80.5666 0000		-70.2411 0000
	B	-46.7285 0000	-49.7909 0000		
	C	45.6444 0000	286.469 0000		301.936 0000
	D	85.2266 0000	242.843 0000		256.627 0000
GDPPC	A	315.065 0001	349.589 0001		-10.8540 0000
	B	-9.81501 0000	-927742 0000		
	C	73.7462 0000	88.4649 0000		211.744 0000
	D	34.4610 0000	291.325 0000		301.448 0000
HFCF	A	-7.52927 0000	-6.95464 0000		-9.04803 0000
	B	-7.40254 0000	.6.69836 0000		

	C	57.65700000	47.20480000	84.38600000
	D	77.73510000	67.86810000	119.5280000
LFP	A	-3.528422	-2.24266.0125	-8.153220000
	B	-7.929500000	-7.079290000	
	C	63.45650000	54.14140000	108.7920000
	D	101.5380000	143.0020000	261.0880000
LNEDUEXP1	A	-362.4480000	-360.7890000	-309.8250000
	B	-197.2570000	-213.6250000	
	C	55.590500000	293.2780000	315.9200000
	D	93.433300000	112.3540000	200.7400000
LNGDPPC	A	-84.474800000	-80.750300000	-66.286500000
	B	-51.717600000	-53.284700000	
	C	50.509900000	289.3000000	292.2000000
	D	60.743100000	300.734	309.6170000
LNHFCE	A	-6.496320000	-5.755150000	-8.471420000
	B	-6.808140000	-6.656280000	
	C	52.575200000	42.862100000	78.262000000
	D	81.939000000	74.057000000	127.8870000
LNREMIT	A	-14.264500000	-12.471000000	-13.038400000
	B	-10.851500000	-9.733390000	
	C	70.5535	116.255	303.177

		0000	0000	0000
	D	61.2591 0000	52.9801 0000	90.2483 0000
REMITANCE	A	-18.8820 0000	-18.5870 0000	-15.8865 0000
	B	14.0735 0000	-14.2292 0000	
	C	43.8735 0000	282.686 0000	301.963 0000
	D	64.5867 0000	53.2536 0000	94.9403 0000

Panel co-integration

Johenson Fisher Panel Cointegration Test

Is there any Long relationship between the Variables? I have applied Johenson fisher Panel Co-integration. Table shows the result of the test applied to the variable. The value of the probability of the Trace test and Maximum Eigenvalue test is significant, and there is no correlation at none, which means that the Null Hypotheses (Ho) is rejected and the Alternative Hypotheses are accepted. And at most 1 the probability of the Trace test and the Maximum Eigenvalue is not correlated, so the Null Hypotheses is accepted and the Alternative Hypotheses is rejected at the At most 1. In Table, we estimate the correlation among the variables. The Panel Cointegration test is used for the time series data, and the data is non-stationary, to determine whether the variables have a stable relationship or not.

Table 3. Result of Johenson Fisher Panel Cointegration Test.

Unrestricted Co-Integration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesised No. of CE(s)	Fisher Stat* (from trace test)	Prob.	Fisher Stat* (From Max-eigen test)	Prob.
None	14.95	0.0207	14.95	0.0207
At Most 1	6.210	0.4001	3.402	0.7570
At Most 2	4.568	0.6003	4.568	0.6003
At Most 3	2.434	0.8758	3.081	0.7986
At Most 4	1.813	0.9361	1.813	0.9361

*probabilities are computed using a symptotic Chi-Square Distribution.

Model No. 1: Panel Fully Modified Least Squares (FMOLS)

Panel Fully Modified Least Squares (FMOLS) was employed in the investigation. The results of the group completely Modified Ordinary Least Squares (FMOLS) analysis for the series data's consistency are shown in Table. A long-term link between the variables is shown in Table. The findings indicate that some variables have positive relationships with one another, whereas other variables have negative relationships. The Gross Domestic Product (GDP growth) and education spending are positively correlated since any nation that raises its educational spending will see an increase in GDP. Thus, the outcome confirmed that there is a positive correlation between education spending and economic expansion. Tamang (2011) discovered a favorable outcome. According to research by Pervesh Tamang, a 1% increase in education spending will result in a 0.11% rise in the economy's gross domestic product.

Reza and Valecha (2012) found a positive and significant result in his study. According to their findings, 1%

change in education expenditure will lead to an average 0.41% change in Real Gross Domestic Product. In Table, the model's variable, labor force participation, has a positive and significant result. It means that if we increase expenditure on labor force participation, it will lead to an increase in the domestic product. If we educate the labor, it means we invest in educated labor. Increasing expenditure on labor will lead to an increase in the productivity of the labor, which will lead to an increase in economic growth. Table expresses the long-run positive relationship among the education expenditure, labor force participation, and gross domestic Product in the economy for economic growth.

In Table, there is a negative result of the household final consumption expenditure on economic growth. It means that if we consume a larger part of our income on the household final consumption expenditure, then our savings will be low, which will cause a low level of investment. That will lead to negative results on the gross domestic product and economic growth. Table expresses the negative result of foreign remittance on the gross domestic product. When people earn in foreign countries that will not be included in the GDP per capita, which is why there is a negative result between the foreign remittance and Gross Domestic Product per capita of any country. So, the model verified that two variables, education expenditure and labor force participation, have a positive and significant result, and the other two variables, household final consumption and foreign remittance, and have a negative result on the gross domestic product of the observational countries.

Table 4. Results of Panel Fully Modified Least Squares (FMOLS).

Long-run Covariance estimate (Bartlett kernel, Newey- West fixed band with)				
Variable	Coefficient	Std. Error	t-Statistic	Prob
LNEDUEXP1	1.353115	0.261734	5.169813	0.0000
LNLFP	0.816473	0.241687	3.378223	0.0010
LNHFCE	-1.845417	0.587619	-3.140501	0.0021
LNREMIT	-0.0037325	0.064401	-0.057835	0.9540
R-squared	-6.762451	Mean Dependent var		11.38135
Adjusted R-Squared	-7.150573	S.D. Dependent var		4.123150
S.E. of regression	11.77127	Sum Squared resid		16627.52
Long-run Variance	0.04105			

Source: Own computation from Eviews 7 software.

Model No 2: Panel Dynamic Least Squares (DOLS)

The coefficient of a cointegrating relationship between the variables can be easily and effectively estimated using the Dynamic Least Squares method. We choose a different estimation method, the Penal Dynamic Least Squares model, since we assume that our variables are non-stationary at the level and stationary at the first difference. This model determines the dynamic outcome by investigating the long-term relationship between the variables. According to the results, there are positive results between some variables and negative results for some variables. Education expenditure has a positive relationship with Gross Domestic Product (GDP growth) in both model FMOLS and DOLS; Both models verified that if a country increases expenditure on education, it will lead to an increase in the gross domestic product. The result verified the positive relationship between the education expenditure and economic growth in the economy. In Table, the result of the variable discussed in the model, the labor force participation has a positive and significant result, and the result is the same in both models, but a slight change in model 2, which is that the probability in the second model is lower than that in model 1. It means that if we increase the expenditure on labor force participation, it will lead to an increase in the domestic product. If we educate the labor, it means we expend on the educated labor. Increasing expenditure on labor will increase the potential of the labor, which will lead to an increase in economic growth. Table expresses the long-run positive relationship among the education expenditure, labor

force participation, and gross domestic Product in the economy for economic growth.

Table 5. Results of Panel Dynamic Least Squares (DOLS).

Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth) used for individual coefficient covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob
LNEDUEXP1	1.327369	0.461883	2.873818	0.0052
LNLFP	1.466291	0.396003	3.702723	0.0004
LNHFCE	-1.811320	0.947861	-1.910955	0.0597
LNREMIT	-0.006552	0.107755	-0.060809	0.95.17
R-squared	-9.139960	Mean Dependent var		11.37267
Adjusted R-Squared	-14.599939	S.D. Dependent var		4.115970
S.E. of regression	16.25675	Sum Squared resid		20613.98
Long-run Variance	0.030851			

Conclusions

Our study has been an attempt to examine the impact of education expenditure on economic growth in the selected countries of the Economic Coordination Organization (ECO). This study comprises Pakistan, Iran, and Turkey. We reviewed the empirical evidence on the relationship between education expenditure and economic growth. To measure the Gross Domestic Product per Capita, we used the government expenditure on education, total (% of GDP), labor force participation, Household final consumption expenditure, and remittance. These variables have much value in the above models. In our study, we used both descriptive statistics and econometric analysis to sketch a few types of facts in a very multipart framework of relationships. The empirical results lead us to a number of interesting conclusions, which are discussed below. As shown in the empirical results, the variables gross domestic product per capita and education expenditure on education total (% of GDP) have positive and significant results in the long-run relationship of the under-observation countries. It is confirmed that when any government increases the budget on education and improves the skills of people, it will lead to the gross domestic product of the country. Tamang (2011) found a positive result in his findings between the education expenditure and economic growth. Tamang found that 1% increase in education expenditure will lead to a 0.11% increase in the gross domestic product of the economy. Reza and Valecha (2012) found a positive and significant result in their study. According to their findings, 1% change in education expenditure will lead to an average 0.41% change in Real Gross Domestic Product.

Our findings also demonstrated a positive and significant correlation between GDP per capita and labor force participation. It implies that a nation's GDP per capita rises when labor force participation rises. Higher educational standards increase labor force efficiency and marginal productivity, which eventually impacts economic growth. Hussin et al. (2012) discovered a noteworthy and favorable outcome in their research. Economic growth and labor force participation are positively correlated. Our results showed that there is a negative relationship among the Gross Domestic Product, Household final consumption, and foreign remittance. It means that when any country's people consume more in the household final consumption and the contribution to education is a smaller proportion, it will lead to low productivity, and that will cause a low level of national income; as a result, gross domestic product per capita will be low

Policy Recommendations

Based on the findings of the present study, several policy recommendations have been proposed to promote sustainable economic growth. Firstly, government expenditure should be strategically allocated to ensure that a

significant portion of the budget is directed toward the education sector. Spending on education is not merely an expense but an investment that yields long-term economic and social benefits for the country. Secondly, investment in education is a fundamental driver of economic progress. It contributes to the development of human capital and facilitates the adoption of modern technology at a lower cost. Therefore, national economic policies should prioritize education as a central pillar of development strategy. Thirdly, countries must strive to provide high-quality education for all citizens. Achieving this goal requires governments to increase their education budgets and ensure equitable access to learning opportunities. No nation can advance economically without improving the quality and reach of its education system. Lastly, the government should subsidize the education sector and organize awareness programs, such as seminars and campaigns, to highlight the benefits of education. Additionally, creating employment opportunities for graduates is essential to motivate individuals to pursue education and contribute productively to the national economy.

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