

IMPACT OF EDUCATIONAL EXPENDITURE ON ECONOMIC GROWTH IN ASIAN COUNTRIES

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ABSTRACT

This study investigates the impact of educational expenditure on the economic growth of 10 Asian countries. Drawing on comprehensive data collected from the World Bank spanning the period of 2017 to 2021, the study employs rigorous econometric analysis to examine the relationship between educational expenditure and key economic growth indicators. By employing various statistical techniques and controlling for potential confounding variables, the study reveals a positive and significant relationship between educational expenditure and economic growth in the Asian context. The findings highlight that increased investment in education, as reflected by higher educational expenditure, is associated with enhanced economic growth outcomes. The positive relationship suggests that countries that allocate a higher proportion of their resources to education experience greater economic development and productivity gains. The inclusion of data from multiple Asian countries provides a comprehensive perspective, capturing the heterogeneity across educational systems, policy frameworks, and socioeconomic conditions. The robustness of the analysis is strengthened by the extensive data set collected from the World Bank, which ensures the reliability and comparability of the findings.

Keywords: Educational Expenditure, Economic Growth, Asian Countries

INTRODUCTION

Education is widely recognized as a critical factor in promoting economic growth and development (Astuti et al., 2021). It is considered an essential investment that can enhance human capital, foster innovation, and improve productivity (Gutema & Bekele, 2004). As a result, governments worldwide allocate a significant portion of their budgets to education expenditure. The effect of education expenditure (EE) on economic growth (EG) has been a topic of interest for policymakers, economists, and researchers alike (Astuti et al., 2021; Chaudhary et al., 2009; Khan et al., 2020). Understanding the relationship between EE and EG is particularly crucial in the context of Asian countries, which have experienced remarkable economic transformation and educational advancements in recent decades.

In many nations, prioritizing investment in education is of utmost importance as it aims to cultivate a highly skilled labor force, thus fostering economic development. Several studies (Haque & Khan, 2019; Song & Zhou, 2019; Zaman et al., 2021) have explored the direct relationship between educational investments and EG. These studies contend that such investments have a positive impact on EG. However, contrasting findings have emerged from other studies (Haque & Khan, 2019; Jenkins et al., 2019), suggesting diverse effects of EE on EG. Liu et al. (2020) discovered a positive correlation between government investment in education and EG. However, found no necessary correlation between government spending and EG. Han and Lee (2020) revealed that EG is not solely dependent on capital, labor, and technology, but also on education.

Song and Zhou (2019), one of the pioneering economists, emphasized the significant impact of education on a nation's economic growth. Mahmood et al. (2019) developed an endogenous growth model that further emphasized human capital as a crucial factor for economic growth, highlighting that education plays a vital role in human capital accumulation. Expanding education has a positive effect on labor productivity, enabling individuals with higher educational qualifications to engage in skilled work, thereby fostering economic growth and nation-building. Zhou et al. (2022) demonstrated a positive relationship between EG and EE. Extensive examination of the relationship between human capital and economic development has been conducted by (Hassan et al., 2019; Jahanger et al., 2022; Mahmood et al., 2019), all of which support the positive association between economic growth and education.

Extensive empirical research has been conducted in developed nations to analyze the influence of EE on EG. However, there has been a notable dearth of studies focusing on Asian countries, despite their emergence as significant players in the global economy. Given the substantial impact of Asian nations on the world economy and their increasing economic activities, it is expected that the development of the education sector will contribute positively to their overall economies. Consequently, this study aims to explore the relationship between EE and EG in ten selected major countries, investigating whether the respective economies' investments in education significantly affect their economic development. By focusing on this specific region, we aim to shed light on the unique dynamics and challenges associated with education and economic development in Asia. Furthermore, this study contributes to the existing literature by providing updated empirical evidence on the relationship between EE and EG, considering the diverse socio-economic contexts within Asian countries.

Problem Statement

Despite the widely acknowledged importance of EE for EG, there is a need to empirically examine the impact of EE on EG in the context of Asian countries. While previous research has explored this relationship on a global scale (Liu et al., 2020; Song

& Zhou, 2019; Vargas-Vargas & Meseguer-Santamaría, 2010; Zaman et al., 2021), focusing specifically on Asian countries allows for a deeper understanding of the region's unique dynamics and challenges in education and economic development. One of the key problems addressed by this study is the lack of comprehensive empirical evidence on the specific impact of EE on EG in Asian countries. While studies conducted in other regions have provided valuable insights, the socio-economic context, cultural factors, and institutional frameworks in Asian countries differ significantly. Therefore, it is crucial to investigate the relationship within this specific regional context to provide tailored policy recommendations that address the unique challenges and opportunities in Asian countries.

Another problem is the heterogeneity among Asian countries in terms of their education systems, levels of economic development, and governance structures. This heterogeneity necessitates a nuanced analysis that takes into account the varying characteristics and circumstances of each country. By considering multiple countries in the analysis, this study aims to capture the diversity within the Asian region and identify specific patterns and factors that influence the relationship between EE and EG.

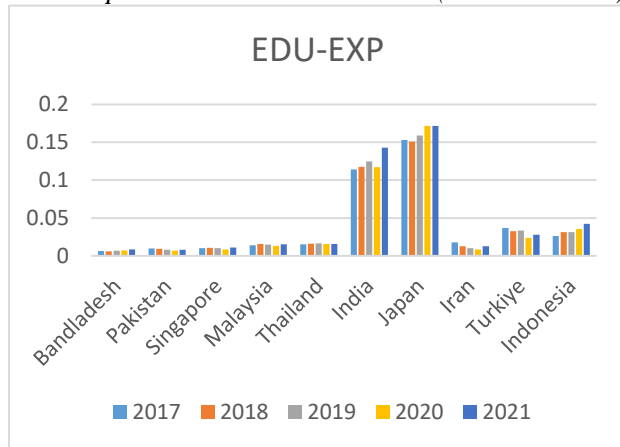
Furthermore, the study seeks to address the limited understanding of the mechanisms through which education expenditure influences EG in Asian countries. While the general consensus suggests that investing in education has positive long-term effects on human capital and productivity (Haque & Khan, 2019; Zaman et al., 2021), the specific channels through which EE translates into EG may vary across countries. Therefore, identifying and analyzing these mechanisms is crucial for formulating targeted policies that can maximize the impact of EE on EG.

Table No.1
Education Expenditure

Countries	2017	2018	2019	2020	2021	Total
Bangladesh	0.006475	0.006099	0.006915	0.00746	0.008778	0.035727
Pakistan	0.009831	0.009256	0.008	0.0069	0.008004	0.041991
Singapore	0.010152	0.010612	0.010098	0.008625	0.011088	0.050575
Malaysia	0.014036	0.015752	0.014965	0.013143	0.015252	0.073148
Thailand	0.015504	0.016141	0.016429	0.015669	0.015908	0.07965
India	0.11395	0.11772	0.12452	0.11704	0.14265	0.61588
Japan	0.15283	0.1509	0.15872	0.17136	0.1715	0.80531
Iran	0.017982	0.012909	0.010188	0.008604	0.012924	0.062607
Turkiye	0.036894	0.032676	0.033396	0.02376	0.027846	0.154572
Indonesia	0.02626	0.0312	0.031332	0.0357	0.04248	0.166972

Source: World Bank (2023)

Figure 1
The Expenditure on Education (Trillion USD)



LITERATURE REVIEW

Education is widely recognized as a crucial determinant of EG and development. It is often argued that investment in education, particularly through government expenditure, can have a significant impact on a country's economic performance. This literature review aims to examine the existing body of research on the relationship between EE and EG, highlighting key findings and methodologies employed in various studies.

Empirical Studies

Jenkins et al. (2019) observed a positive correlation between education and EG. Zaman et al. (2021) conducted a comprehensive analysis of 129 countries and similarly concluded that there is a positive

relationship between education and EG. However, contrasting these findings, some empirical studies suggest that education and EG are not significantly intertwined. Haque and Khan (2019) discovered that the expansion of human capital does not have a significant association with the EG rate. Anser et al. (2020) proposed a potential positive correlation between education and EG but emphasized that the relationship does not necessarily explain the influence of education on EG. According to their perspectives, both education and EG can be influenced by total factor productivity. (Song & Zhou, 2019) conducted a study suggesting that schooling has a limited role in EG. However, Zaman et al. (2021) countered this viewpoint by employing an endogenous growth model across 87 countries. Their findings indicated a positive relationship between gross secondary school enrollment, public expenditure on education, expected schooling of girls, and economic growth. Haque and Khan (2019) investigated the feedback relationship between education and EG using Granger causality analysis across 86 countries from 1990-2016. Their results demonstrated that both education investment and educational institutions significantly influenced EG. Jaquul (2004) conducted a study examining the causality between education and EG specifically in France and Germany during the Second World War. The findings indicated that education had a significant impact on “Gross Domestic Product (GDP)” in France, whereas it did not play a crucial role in EG in Germany. Similarly, Liu (2006) investigated the causality and cointegration between education and GDP in China, revealing that EG was the driving force behind higher education levels in

China. In a separate study, (Islam et al., 2007) analyzed the relationship between “education” and EG in Bangladesh using multivariate causality analysis spanning the period from 1976 to 2003. The results demonstrated the presence of bidirectional causality between education and the growth rate in Bangladesh.

Chang et al. (2009) conducted an analysis of the causality between EG and higher education in China from 1972 to 2007. Their results revealed a long-term relationship between higher education and the nation's GDP. Mishra et al. (2009) examined the relationship between “higher education” and ED in India from 1951 to 2002 using an error correction model. The study identified unidirectional causality from “education” to EG. Chaudhary et al. (2009) investigated the role of “higher education” in EG in Pakistan from 1972 to 2005 using “Johansson Cointegration and Toda-Yamato causality approach in VAR analysis”. Their findings indicated only unidirectional causality from EG to “higher education”. Gutema and Bekele (2004) utilized “Lucas's (1988)” endogenous growth model to analyze the impact of “education” on EG in Guatemala from 1951 to 2002. Their study revealed that education played a significant and positive role in EG, particularly through the contribution of better-educated labor. In a study conducted by (Katircioglu, 2009) in North Cyprus, evidence of unidirectional causality from “higher education” to EG was found. Several cross-country studies have explored the relationship between education expenditure and economic growth. For instance, (Hanushek & Kimko, 2000) analyzed data from a large sample of countries and found a positive and significant correlation between “educational investments” and EG. Similarly, (Temple & Wößmann, 2006) examined a panel of countries and observed that higher levels of EE were associated with increased economic output. More recently, Vilella and Paredes (2022) examined the effect of educational expenditure on economic growth. They collected data from 1990-2020 and found no significant impact of EE on EG of Honduras. Similarly, Lupu and Nuță (2023) investigated the same relationship in 11 Central Europe eastern states. Their study revealed mixed result. In some states they found positive relationship between EE and EG, while in other they got negative relationship. These mixed results

warrant more studies particularly in developing countries. Thus this study is intended to examine the same relationship in Asian countries.

Theoretical Perspectives Human Capital Theory

Human capital theory posits that education enhances the knowledge, skills, and productivity of individuals, which in turn contributes to economic growth (Sweetland, 1996). Researchers have found support for this theory, emphasizing that increased education expenditure leads to the accumulation of human capital, which positively affects EG.

Endogenous Growth Theory

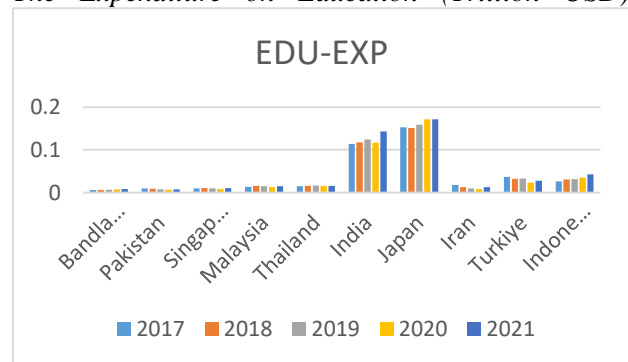
Endogenous growth theory suggests that education expenditure can foster technological progress and innovation, leading to sustained economic growth (Smulders, 2002). Studies have shown that investment in education contributes to the creation and dissemination of knowledge, which drives productivity gains and economic development.

METHODOLOGY

To check the impact of EE on EG, panel data is obtained from world Bank. Education expenditure can be measured as a percentage of GDP, per capita spending, whereas, economic growth is measured as the GDP growth rate. Ten Asian countries are selected for data collection, and data is collected from 2017-2021.

Figure 2

The Expenditure on Education (Trillion USD)



Research Hypothesis

H₁: “There is a positive impact of Educational Expenditure on Economic growth”

Descriptive Statistics

The descriptive characteristics of the data is presented in table no. 2. The mean and standard deviation of the GDP and Education expenditure is given.

Table No. 2

Descriptive Statistics of GDP

Sr. No	Countries	GDP Mean	SD	Edu-EXP Mean	SD
1.	Bangladesh	0.3508	.047	0.007145	.0008
2.	Pakistan	0.3326	.022	0.008398	.001
3.	Singapore	0.374	.018	0.010115	.001
4.	Malaysia	0.3504	.021	0.01463	.0008
5.	Thailand	0.502	.031	0.01593	.0005
6.	India	2.802	.21	0.123176	.01
7.	Japan	5.004	.09	0.161062	.01
8.	Iran	0.3396	.09	0.012521	.001
9.	Turkiye	0.8086	.05	0.030914	.005
10.	Indonesia	1.078	.06	0.033394	.007

CORRELATION

The intercorrelation between education expenditure and economic growth is presented in Table no. 3. It indicates that both the variables are positively correlated with correlation coefficient value of 0.98 which is significant at $p < 0.05$. The value suggests that by increasing one variable, it will positively affect the other variable.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.982816
R Square	0.965928
Adjusted R Square	0.961669
Standard Error	1.506312
Observations	10

<i>ANOVA</i>					
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	514.59	514.59	226.7940728	3.74E-07
Residual	8	18.1518	2.268975		
Total	9	532.7418			

	<i>Coefficients</i>	<i>Un St Beta</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.16921		0.612632	0.276203	0.789393618	-1.24352	1.581941	-1.24352	1.581941311
X Variable 1	27.80723	0.98	1.846469	15.05968	3.73659E-07	23.54927	32.0652	23.54927	32.06519601

Table No. 3

Correlation

	<i>GDP</i>	<i>EduEXP</i>
GDP	1	
EduEXP	0.98	1

Significant $p < 0.05$

Regression Model

“ $GDP_{it} = \alpha_i + \beta_2i \ln EXE_{it} + \epsilon_{it}$,

for $t = 1, \dots, T$; $I = 1, \dots, N$. Where T refers to the number of observations over time and

N refers to the number of individual countries in the panel”.

To check the impact of education expenditure on economic growth, the panel data was analyzed with linear regression model in SPSS. The regression summary is provided in table 4. The result indicates that the R-Square value of 0.96, is found significant at F value (226.7) $P < 0.05$. It suggests that 96% of the variability in the dependent variable is accounted for by the independent variable. The unstandardized beta value of 27.8 found significant with t value of 15, $p < 0.05$. The result provides ample proof for the acceptance of the proposed hypothesis.

Table No. 4

DISCUSSION AND CONCLUSION

The present study was intended to examine the impact of education expenditures on the economic growth of the Asian countries. For this purpose, panel data were collected from world bank of 10 Asian countries for the years (2017-2021). Ten Asian countries were, Bangladesh, Pakistan, Singapore, Malaysia, Thailand, India, Japan, Iran, Turkiye, and Indonesia. Regression analysis was performed to test the impact of EE on EG. For EE, the data were calculated as the percentage spending on education of the GDP of the country. EG was measured as the GDP of each country for the study period. After performing the regression analysis of the collected data, it was found that educational expenditure has a positive impact on the economic development of the Asian Countries.

The findings of this study is consistent with the previous findings (Jenkins et al., 2019; Song & Zhou, 2019; Zaman et al., 2021). The results indicate that Educational expenditure plays a significant role in the economic growth of Asian countries. Here are some ways in which educational expenditure can have a positive impact. Investing in education enhances human capital, which refers to the knowledge, skills, and abilities of individuals. By allocating resources to education, countries can improve the quality and quantity of their workforce. A well-educated population is more likely to be productive, innovative, and adaptable to changing economic conditions, thereby fueling economic growth. Furthermore, Education is closely linked to technological progress. Increased investment in education enables the development and acquisition of knowledge and skills required for technological innovation. As countries invest in research and development, scientific advancements, and technological infrastructure, they create an environment that fosters innovation, leading to economic growth and competitiveness in global markets. Education equips individuals with the necessary skills to perform their jobs effectively. By investing in education and providing quality training, countries can improve labor productivity. Educated individuals are often more efficient, can adapt to new technologies and work methods, and are better equipped to contribute to economic activities, resulting in increased productivity levels across various sectors. In addition, Education fosters an

entrepreneurial mindset and supports the development of innovative ideas. By investing in education, countries can nurture a culture of entrepreneurship, creativity, and critical thinking. Well-educated individuals are more likely to start businesses, introduce innovative solutions, and contribute to economic diversification and job creation.

CONTRIBUTION

The study can help policymakers understand the relationship between EE and EG. It provides evidence and analysis to guide policy formulation related to education and economic development. Policymakers can use the findings to design strategies and allocate resources effectively to enhance educational outcomes and promote economic growth. The study can assist governments in making informed decisions regarding the allocation of financial resources. By examining the impact of EE on EG, policymakers can prioritize funding for education, ensuring that adequate resources are allocated to improve educational quality, infrastructure, and accessibility. This can lead to more targeted and efficient resource allocation. Understanding the impact of educational expenditure on EG enables long-term planning. Governments can develop comprehensive education strategies that align with their economic development goals. By considering the potential benefits of educational investment, policymakers can establish long-term plans to promote human capital development, technological advancement, and productivity growth.

Limitation and Future Research Recommendation

While studying the impact of educational expenditure on economic growth in Asian countries is valuable, it is important to acknowledge certain limitations that may affect the scope and generalizability of the study's findings. Here are some potential limitations to consider:

Establishing a direct causal relationship between EE on EG can be challenging. Economic growth is influenced by multiple factors such as governance, infrastructure, market conditions, and socio-cultural factors. Isolating the specific impact of educational expenditure can be difficult due to the presence of

confounding variables and the complex interplay between different factors.

Data were collected for the period of 5 years (2017-2021) which limits its generalizability. Hence, a comprehensive approach is warranted by getting the data for the last 10 years at least to get more reliable results.

The data were collected from 10 Asian countries which again limits its generalizability; thus all Asian countries may be selected in a sample frame to get a real picture of the trends of Asian countries in terms of educational expenditure and economic growth.

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