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The Dynamic Impact of Foreign Debt-Based Education and Health Investment on Economic Growth in Asean-5 Countries

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Abstract

This study examines the use of external debt to finance health and education in order to promote economic growth in developing countries, focusing on five ASEAN member countries namely Cambodia, Indonesia, Laos, the Philippines and Thailand. The Johansen, Pedroni and Kao cointegration test results indicate the existence of a long-run relationship between the independent and dependent variables. The panel data Autoregressive Distributed Lag (ARDL) model is used to analyze the short-term and long-term effects using annual data for the period 2000-2022. The results of this study found that in the short run education financing has a positive effect while health, labor and capital financing have a negative impact on economic growth. The results in the long run found that education and health financing have a negative impact on economic growth in ASEAN-5 countries due to too high debt and inefficiency in allocation is also one of the reasons the long-term effect has not been realized. Labor and capital have a positive impact on economic growth this is due to high external debt in many ASEAN-5 countries is also high, although this is not proportional to external debt and the effect is very small. Based on the findings of this study, it is recommended that governments in ASEAN-5 countries continue to improve efficiency in managing and allocating foreign debt towards education and health. In addition, serious efforts are needed for more assertive and targeted policies related to the use of foreign debt.

Keywords: Education, Health, External Debt, Economic Growth, Panel ARDL.

1. Introduction

A country's economy is always related to efforts to improve people's welfare. Economic growth is a crucial element in a country's development strategy as it has a direct impact on people's welfare and economic stability. Thus, building an economically prosperous society is a must (Zeeshan et al., 2022). In macroeconomic theory, economic growth is often measured through increases in Gross Domestic Product (GDP). GDP reflects the total value of goods and services produced within a country in a given period. However, high economic growth alone is not enough to ensure people's welfare. Such growth must be inclusive, sustainable, and have a direct impact on improving the quality of life of the people. (Todaro & Smith, 2015)

There are two reasons why a country must achieve economic growth, namely to create jobs for its population, which is increasing in number, and to increase the level of prosperity of the people. (Uddin et al., 2020). In this case, economic development is carried out by all countries, including countries that are members of ASEAN. ASEAN countries have a fairly high economic growth rate compared to many other developing countries. Factors that drive economic growth in ASEAN countries include macroeconomic stability, increased foreign direct investment (FDI), and more open trade policies. In addition, the diversity of natural resources, the development of the manufacturing sector, and the digitalization of the economy also contribute to sustainable economic growth in the region.

In general, the government's role in the economy is quite broad, and the government budget framework can be used to encapsulate many different types of activities. The way a country budgets can vary depending on the state of its economy. A country may budget in a balanced way if economic conditions are normal. A surplus budget policy can be applied when there is a change in expansionary fiscal policy or contractionary fiscal policy so that the government has three options to cover the state budget deficit, namely from the proceeds of privatization of state-owned enterprises, domestic debt, and foreign debt funds. (Cifuentes-Faura et al., 2022) Debt is a source of funds for developing countries that can be used to accelerate their economic growth. This happens when there are not enough funds available from

domestic savings, hence the need for debt, especially external debt. The government of the country concerned may choose to seek assistance in the form of debt to address the shortage of funds in developing countries, particularly in ASEAN. (Agyeman et al., 2022)

According to Khan et al. (2022), external debt can provide the capital injection needed for economic growth, but excessive reliance on debt can also bring risks to long-term economic stability. Inappropriate use of debt can hinder a country's ability to increase its economic growth (Adelejare et al., 2022). According to Asnawi et al. (2023), foreign debt has both positive and negative impacts on economic growth in ASEAN countries. Foreign debt can be a development tool when managed properly and positively affects economic growth. Yuliana et al. (2023) found that external debt has a negative impact on economic growth in ASEAN countries with risks associated with excessive borrowing. Furthermore, Uddin et al. (2020) revealed that government spending to finance economic development using foreign debt is indeed profitable. However, the side effect is an increasing debt burden in the future. At the same time, financing the capital structure of any economy depends on foreign debt, low productivity and income, and a lack of savings rate (Mohsin et al., 2021).

ASEAN-5 countries have historically used external debt as one of the main sources of financing economic development. External debt is used to finance various sectors, including infrastructure, manufacturing, education, and health, in the hope of improving people's welfare and accelerating economic growth. However, poor social and economic amenities and limited access to high-quality health and education services point to unfavorable long-term effects of government borrowing in ASEAN-5 countries. Utilizing external debt to finance consumption needs and short-term administrative emergencies will only worsen the debt situation and hamper economic growth in ASEAN-5 countries.

Another factor that influences the effectiveness of external debt is the way ASEAN-5 countries allocate and manage these funds. Some countries have more effective systems in place to ensure that debt is used for productive projects, while others still face challenges of bureaucracy, corruption and inefficiency in public budget management. Some ASEAN countries also have limited social and economic amenities, and still face challenges in ensuring equitable access to high-quality healthcare and education. This situation raises the question of whether external debt used for investment in these sectors can actually boost economic growth or if it can worsen the country's dependence on foreign debt.

Based on the problems of foreign debt and economic growth in ASEAN-5 countries, it can be seen from the problems that occur at this time and the results of several previous studies. Based on the formulation of the problems in this study, the objectives to be achieved are to analyze the impact of investment in education, health, and foreign debt on economic growth in ASEAN-5 countries in the short and long term

The issues raised in this study arise in response to the reality of ASEAN-5 countries' dependence on financing development through external debt, particularly in the education and health sectors. Although external debt is often considered as a strategic funding alternative to promote economic growth (Khan et al., 2022) and (Adelejare et al., 2022), the effectiveness of its utilization in the social sector is still debatable.

Many developing countries face structural constraints such as bureaucracy, inefficiency, and corruption that cause debt-based investments to not fully positively impact long-term economic growth (Yuliana et al., 2023; Uddin et al., 2020). In addition, high debt burdens often reduce budget allocations for critical programs such as education and health services, negatively impacting public welfare and labor productivity (Loayza & Raddatz, 2019; Thinagar et al., 2021). The disparity between the size of the debt burden and the expected returns from the education and health sectors calls for an in-depth evaluation of the real contribution of external debt-based investments to the region's economic growth (Triatmanto et al., 2023). The formulation of the problem in this study was born from the need to find out whether the financing strategy through external debt in the education and health sectors provides real benefits or creates structural dependency that weakens the economic independence and stability of ASEAN-5 countries (Reinhart & Rogoff, 2010).

This study examines the use of external debt to finance health and education in order to promote economic growth in developing countries, focusing on five ASEAN member countries namely Cambodia, Indonesia, Laos, Philippines and Thailand. Thus, based on the description on the background, the problem formulation that can be identified for this study is “How is the impact of investment in education, health, based on foreign debt on economic growth in ASEAN-5 countries in the short term and long term”.

2. Literature Review

This study measures economic growth using Gross Domestic Product (GDP). GDP per capita is a key indicator in assessing economic growth, as it takes into account a country's population in its calculation. It can be used to evaluate the economic well-being and standard of living of a population (Mankiw, 2018). According to Well (2014), an increase in GDP per capita indicates that, on average, each individual in the population earns more income or produces more output, which is typically associated with an improvement in the standard of living. Akram, (2011) analyzed the impact of debt on Pakistan's economy by examining external debt stock, exports, imports, investment, and openness data. To

this end, the ARDL unit root test, VECM, and ADF were employed. The findings of the study indicate that there is a long-term negative relationship between Pakistan's per capita GDP and external debt.

Musibau et al. (2018), using data from 1980 to 2015, identified a causal relationship between external debt and economic growth in both the long run and the short run. Kharusi & Ada (2018) employed the ARDL approach to analyze data from the 1990–2015 period in order to assess the impact of external debt on economic growth in Oman. Their findings indicate that during the period under review, Oman's economic development was negatively affected by external debt. Mohsin et al. (2021) analyzed the relationship between external debt and economic growth in South Asian countries, namely Afghanistan, Bangladesh, Bhutan, India, Pakistan, Sri Lanka, the Maldives, and Nepal. The results indicate that external debt has a negative impact, while the stock of external debt has a positive impact on economic growth. Robust regression analysis supports these findings, showing that total external debt and the impact of external debt on economic growth account for 39 percent and 31 percent, respectively. Furthermore, a study conducted by (Roy, 2023) aimed to provide empirical insight into how the relationship between external debt, crude oil prices, and personal remittances affects economic growth in India. He found that external debt contributes to lower economic growth in both the long and short term.

3. Materials and Methods

3.1. Materials

This study covers the period from 2000 to 2022 and focuses on the ASEAN-5 countries, namely Cambodia, Indonesia, Laos, the Philippines, and Thailand. The data used in this research are secondary data obtained from the World Bank, the World Health Organization (WHO), the Asian Development Bank (ADB), and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

3.2. Methods

The analytical method used in this study is the panel data Autoregressive Distributed Lag (ARDL) approach. The Panel Autoregressive Distributed Lag (ARDL) model is used to analyze both short-run and long-run relationships among variables in panel data, accommodating variables integrated at different levels (I(0) or I(1). Using the data obtained, the model is formulated as follows :

$$EN = f(L,C,HC) \tag{1}$$

As sectoral data on external debt allocation is not available, this study uses the rasio of sector to total external debt as an alternative approach to measure relative effectiveness. The variables EDU (education), HLT (health), LAB (labor), and CAP (capital) are each divided by EXD (external debt), forming a rasio of :

$$HC = f\left(\frac{IEDU}{EXD}, \frac{IHLT}{EXD}\right) \tag{2}$$

$$ECG = f\left(\frac{IEDU}{EXD}, \frac{IHLT}{EXD}, \frac{LAB}{EXD}, \frac{CAP}{EXD}\right) \tag{3}$$

Model II to analyze the dynamic impact of foreign debt-based education and health investment on economic growth in the short and long run

$$\Delta ECG = a_0 + \sum_{j=1}^{P} \beta_{ij}\, \Delta ECG_{it-j} + \sum_{j=1}^{q1} \beta_{1ij}\, \Delta EDU_{it-j} + \sum_{j=1}^{q2} \beta_{2ij} \Delta HLT_{2it-j} + \sum_{j=1}^{q3} \beta_{3i}\, \Delta LAB_{3it-j} + \sum_{j=1}^{q} \beta_{4i}\, \Delta CAP_{3it-j} + \lambda \mathrm{ECT}_{it-1} + \varepsilon_{it} \tag{4}$$

Where ECG is GDP per capita; EDU is government health financing as a percentage of GDP; HLT is government health financing as a percentage of total government expenditure; LAB is labor force; CAP is gross fixed capital formation.

4. Results and Discussion

4.1 Descriptive Statistics

Descriptive statistics provide a general overview of the data used, including both dependent and independent variables. This overview is derived from information presented in the descriptive statistics, such as the mean, median, minimum, maximum, standard deviation, and the number of observations for each variable in this study. Table 1

presents the descriptive statistics for GDP per capita, health financing, labor force, and capital over the period 2000 to 2022.

Table 1. Descriptive Statistics

	GDP/EXD	EDU/EXD	HLT/EXD	LAB/EXD	CAP/EXD
Mean	0.13	0.15	0.10	1.69	0.64
Median	0.12	0.07	0.08	1.83	0.65
Maximum	0.45	0.57	0.34	3.54	1.32
Minimum	-0.38	0.01	0.02	0.33	0.09
Std. Dev.	0.11	0.15	0.07	0.78	0.30
Skewness	-0.52	0.93	1.05	0.04	0.33
Kurtosis	6.84	2.42	3.42	2.23	2.32
Jarque-Bera	75.87	18.08	21.92	2.85	4.26
Probability	0.00	0.00	0.00	0.24	0.12
Observations	115	115	115	115	115

The descriptive statistics shown in Table 1 represent the data analyzed for the research period 2000-2022 in the form of annual data with a total number of observations of 115. The average foreign debt-based education financing in ASEAN-5 countries is 0.15 percent, indicating that in general, the proportion of foreign debt allocation used for the education sector in ASEAN-5 countries is still very low. The highest amount of financing is 0.57, indicating that in some years or in certain countries, there is an increase in the allocation of education financing from foreign debt. However, the lowest value is 0.01 percent. This indicates that in some conditions, almost no part of foreign debt is allocated to education.

Foreign debt-based health financing during 2000-2022 had an average value of 0.10 percent with a maximum value of 0.34 percent and a minimum value of 0.02 percent. These values indicate that the contribution of foreign debt to health sector funding is still very limited. There are some years and some countries where health financing from external debt has reached its highest point. This could indicate a special fiscal policy or program in a particular year that specifically channels foreign debt to fund the health sector, for example the health crisis caused by covid-19. There are also certain years where health financing from external debt is very small due to the focus of financing in other sectors, such as infrastructure or macroeconomic stability.

The percentage of Labor based on external debt averaged 1.69 percent. This means that in general, for every 100 units of external debt acquired, only about 1.69 percent on average is linked to or contributes to labor. The highest percentage is 3.54 percent. indicating that at the highest point in one particular country or year, external debt is able to be associated with a contribution to labor of more than 3 percent. and the lowest at 0.33 percent indicates that the contribution of labor to external debt is very low. The descriptive statistics results show that the average percentage of labor to external debt in ASEAN-5 countries during the period 2000-2023.

In the foreign debt-based capital financing variable, there is an average value of 0.64 with a maximum value of 1.32 and a minimum value of 0.09. This shows that 64 percent of the value of external debt contributes to capital formation in general. This could include investment in infrastructure, means of production, technology, and other productive sectors. This figure is enough to show that external debt has a moderate link to capital formation, although it is not fully optimized. At its highest point, 1.32, it means that in certain years and countries, the value of capital formation even exceeds the value of foreign debt received. This can happen if: External debt is used very efficiently to finance capital projects (e.g. large-scale infrastructure projects that trigger further investment). There is a multiplier effect, where the use of debt triggers private investment or other capital flows that support capital increase. Meanwhile, the minimum value of 0.09 indicates that in some years or in certain countries, only 9 percent of external debt contributes to capital formation. This indicates a very low effectiveness of debt utilization.

4.2 Unit Root Test for Stationarity

To determine the best panel model, further testing is required in the form of the Chow test, Hausman test, and Lagrange Multiplier (LM) test. The test results of determining the best model are shown in Table 2.

Based on the test results in Table 2, it can be concluded that the 5 variables of this study have been stationary at different levels. GDP economic growth is stationary at the level, while other variables such as education financing, health financing, labor, and capital are not stationary at the level.

Table 2. Unit Root Test for Stationarity

Variabel	ADF Test		PP Test		Im, Pesaran & Shin Test		Levin, Lin & Chu Test	
	Level 1(0)	First Difference 1(1)	Level 1(0)	First Difference 1(1)	Level 1(0)	First Difference 1(1)	Level 1(0)	First Difference 1(1)
GDP/EXD	0.0021**	-	0.0021**	-	0.002**	-	0.0024**	-
EDU/EXD	-	0.0000***	-	0.0000***	-	0.0000***	-	0.0000***
HLT/EXD	-	0.0000***	-	0.0000***	-	0.0000***	-	0.0000***
LAB/EXD	-	0.0000***	-	0.0000***	-	0.0000***	-	0.0000***
CAP/EXD	-	0.0000***	-	0.0000***	-	0.0000***	-	0.0000***

4.3 Optimal Lag Length

It is also required to establish the lag length while estimating the ARDL model. This may be done by utilizing the AIC or the SIC, which are the Akaike information criteria or the Schwartz information criteria, respectively, which decide the number of lags to be utilized in the regression

Table 3. Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	206.71	NA	3.17e-09	-5.38	-5.22	-5.32
1	565.72	660.5763	4.31e-13*	-14.28579*	-13.35880*	-13.91565*
2	578.81	22.33762	5.97e-13	-13.97	-12.27	-13.29
3	599.79	33.01808	6.80e-13	-13.86	-11.39	-12.87
4	626.96	39.11613	6.70e-13	-13.92	-10.67	-12.62
5	646.56	25.61226	8.32e-13	-13.77	-9.76	-12.17
6	664.83	21.44425	1.12e-12	-13.60	-8.81	-11.68
7	706.34	43.16984*	8.48e-13	-14.04	-8.47	-11.81
8	737.74	28.46556	9.09e-13	-14.21	-7.87	-11.68

The results above show that lag 1 is chosen by most criteria such as Akaike, Schwarz, Hannan-Quinn and Final Prediction Error as the optimum lag. To get the best estimation results, the lag obtained will be used to estimate this study.

4.4 Cointegration Test

In order to use the ARDL method, it is necessary to check the existence of long-run relationships in the model or cointegration testing. This study applies Johansen Fisher Panel Cointegration Test, Pedroni test and Kao test to test for cointegration.

Table 4. Cointegration Test

Johansen			Pedroni				Kao
Trace Test			Panel PP-Statistic	Panel ADF-Statistic	Group PP-Statistic	Group ADF-Statistic	ADF
H0	Ha	P Value	P Value	P Value	P Value	P Value	P Value
$r \leq 0$	$r > 0$	0	0.0000	0.0000	0.0000	0.0000	0.0000
$r \leq 1$	$r > 1$	0.0003					
$r \leq 2$	$r > 2$	0.0251					

The test results above show Johansen, Pedroni and Kao have a value <0.05 which means ≠0 so it can be concluded that there is a long-term cointegration relationship between economic growth and other independent variables.

4.5 Autoregressive Distributed Lag (ARDL)

Table 5. Autoregressive Distributed Lag (ARDL)

	Variable	Coefficient	Std. Error	t-Statistic	Prob.
Short run	COINTEQ	-0.9542	0.2997	-3.1841	0.0020***
	D(EDU_EXD)	1.6582	2.5174	2.5174	0.0135**
	D(EDU_ EXD (-1))	-1.4264	-0.9208	-0.9208	0.3594
	D(HLT_ EXD)	-3.9348	-1.3418	-1.3418	0.1828
	D(HLT_ EXD (-1))	-0.9209	-0.3607	-0.3607	0.7191*
	D(LAB_ EXD)	-0.0396	-0.5493	-0.5493	0.5841
	D(CAP_ EXD)	0.2386	1.4814	1.4814	0.1418
Long run	EDU_EXD	-0.3666	0.0904	-4.0538	0.0001***
	HLT_EXD	-0.6384	0.1057	-6.0394	0.0000***
	LAB_EXD	0.1346	0.0286	4.7058	0.0000***
	CAP_EXD	0.0434	0.0529	0.8211	0.4135

In the short term, only education investment has a positive and significant effect on economic growth, meaning that in the short term education investment has a better influence on economic growth in ASEAN-5 countries. An increase in foreign debt-based education investment can increase economic growth. However, this does not continue in the long run. In contrast, foreign debt-based investment in health, labor and capital has a real impact on economic growth, it may still take time to have a real impact on economic growth, or perhaps the high foreign debt burden conditions hinder the effectiveness of utilization and also the adaptation or adjustment of policies that are not optimal.In the short term, only education investment has a positive and significant effect on economic growth, meaning that in the short term education investment has a better influence on economic growth in ASEAN-5 countries. An increase in foreign debt-based education investment can increase economic growth. However, this does not continue in the long run. In contrast, foreign debt-based investment in health, labor and capital has a real impact on economic growth, it may still take time to have a real impact on economic growth, or perhaps the high foreign debt burden conditions hinder the effectiveness of utilization and also the adaptation or adjustment of policies that are not optimal.

In the long run, investment in education and health has a negative and significant effect on economic growth. This means that the portion of foreign debt used for education and health investment actually reduces the effectiveness of economic growth, this is due to too high debt and low allocation to education and health investment. Inefficiency in allocation is also one of the reasons the long-term effect has not been realized. For the labor variable, it has a positive and significant impact, proving that foreign debt used for infrastructure development can increase labor. Meanwhile, the capital variable does not have a significant effect, meaning that capital accumulation has not been optimal or has not had a large enough impact in the long term on economic growth. This can be caused by the low efficiency of capital utilization, inappropriate investment concentration, debt burden that reduces fiscal space, and external factors such as economic instability and institutional weaknesses that hinder the effectiveness of capital as the main driver of growth.

4.6 Panel Fully-Modified Ordinary Least Square (FMOLS)

Table 6. Panel Fully-Modified Ordinary Least Square (FMOLS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDU_DEBT	-0.3628	0.1346	-2.6952	0.0082***
HLT_DEBT	-0.4767	0.1791	-2.6620	0.0090***
LAB_DEBT	0.1230	0.0279	4.4129	0.0000***
CAP_DEBT	0.0845	0.0607	1.3927	0.1668
R-squared	0.4884	Mean dependent var		0.1323
Adjusted R-squared	0.4479	S.D. dependent var		0.1087
S.E. of regression	0.0808	Sum squared resid		0.6594
Long-run variance	0.0034			

The results in Table 6 Robustness check with FM-OLS support the main estimation results, especially on the significant effect of foreign debt-based education investment variable has a negative and significant effect on economic growth, foreign debt-based health investment has a negative and significant effect on economic growth, foreign debt-based labor has a positive and significant effect on economic growth, and capital has a positive and insignificant effect on economic growth in Asean-5 countries. Therefore, the previously estimated dynamic model is consistent with the long-run results obtained through FM-OLS, strengthening the validity of the research findings.

4.7 Stability Test

To see the stability of the research model, CUSUM test this research model. The results of the model stability test are shown in Figure 4.7. The CUSUM test results show a CUSUM line that is between critical values with a 5 percent confidence level. This result confirms that the model used is stable during the study period.

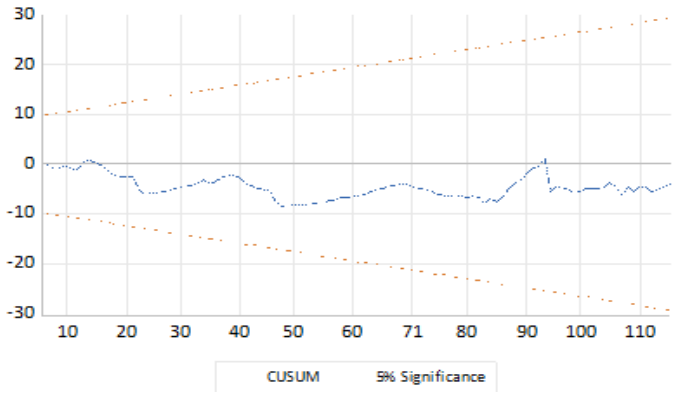

Figure 1. Stability Test

5. Conclusion

This study examines the impact of foreign debt-based education and health investment on economic growth in ASEAN-5 countries, namely Cambodia, Laos, Indonesia, the Philippines and Thailand. This study uses panel data for the period 2000-2022. Based on the results of the analysis using ARDL, the following conclusions can be drawn:

The results show that investment in education and health has a negative and significant effect on economic growth in ASEAN-5 countries in the long run. This means that the utilization of foreign debt used for education and health investment has not been able to increase economic growth. Focus and inefficiency are the main reasons. The labor variable has a positive and significant impact on economic growth. Meanwhile, the capital variable has no significant effect on economic growth.

In the short term, only education investment has a positive and significant effect on economic growth. Health, labor and capital investment have no effect on economic growth. This means that in the short-term time period, changes in these variables have not shown a significant impact on economic growth in ASEAN-5 countries. This condition can be caused by policies directed at the health, labor, and capital sectors have not been able to directly and significantly boost economic growth, especially when viewed in the context of the ratio to external debt. Some other factors are delays in policy transmission or structural impacts that take longer to influence economic growth.

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