

Analysis of the Effect of Tax Revenue and Government Expenditure on the Education Sector on the Human Development Index in ASEAN-6 Countries

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ABSTRACT

This study aims to examine the effect of government expenditure on the health and education sectors on the Human Development Index (HDI) in six major ASEAN countries (Indonesia, Malaysia, Thailand, the Philippines, Singapore, and Vietnam) during the 2012–2021 period. The data were obtained from three primary sources: the Organisation for Economic Co-operation and Development (OECD), the United Nations Development Programme (UNDP), and the World Bank. The study employs multiple linear regression with a panel data approach. Prior to the estimation, a series of classical assumption tests including normality, multicollinearity, heteroscedasticity, and autocorrelation tests were conducted to ensure the validity and reliability of the regression model. The results indicate that government expenditure on the health and education sectors has a positive and statistically significant effect on the HDI of ASEAN-6 countries. These findings underscore the importance of effective budget allocation in the social sector to promote sustainable human development across the ASEAN region and provide strategic policy implications for governments in designing budget allocation policies that prioritize the education sector to improve people's quality of life

INTRODUCTION

The analysis of the impact of government expenditure on the health and education sectors on the Human Development Index (HDI) in ASEAN-6 countries has become an important topic in the context of human capital development and regional economic growth. The concept of human development measurement was first introduced by the United Nations Development Programme (UNDP) in 1990 through the Human Development Index (HDI), which has since been published annually in the *Human Development Report (HDR)* (Adi, 2018).

Government expenditure on the health sector reflects a country's commitment to improving citizens' well-being while serving as a fiscal instrument to promote social equity and enhance national productivity (inhibits glucagon gene expression through Pax-6, 1996).

Previous studies have demonstrated that increased public spending on healthcare is positively and significantly associated with improvements in HDI, particularly in developing countries (Anyanwu & Erhijakpor, 2009). However, the effectiveness of such expenditure depends on the quality of governance, the allocation of resources, and the institutional capacity of healthcare systems.

ASEAN-6 countries—Indonesia, Singapore, Malaysia, Thailand, Vietnam, and Cambodia—display considerable variation in government expenditure on education and its contribution to human development. Public investment in education has been shown to significantly improve HDI by expanding educational access and enhancing educational quality, particularly in regions with relatively low HDI levels where education serves as a key driver of human development and economic growth (Nugroho, 2016).

Singapore, for example, is recognized for its highly efficient healthcare system, characterized by broad service coverage and high-quality healthcare, which has contributed to its consistently high HDI ranking (“Overview: Learning to Realize Education’s Promise,” 2017). In contrast, countries such as Cambodia and Indonesia continue to face challenges related to healthcare accessibility, service quality, and the availability of medical facilities in remote areas, thereby limiting their human development achievements (ASEAN, 2023).

Furthermore, health is a fundamental determinant of human development because it directly influences labor productivity and overall quality of life (Todaro & Smith, 2020). Governments therefore play a strategic role in improving public health through expenditure on healthcare infrastructure, medical facilities, healthcare services, and preventive and promotive health programs.

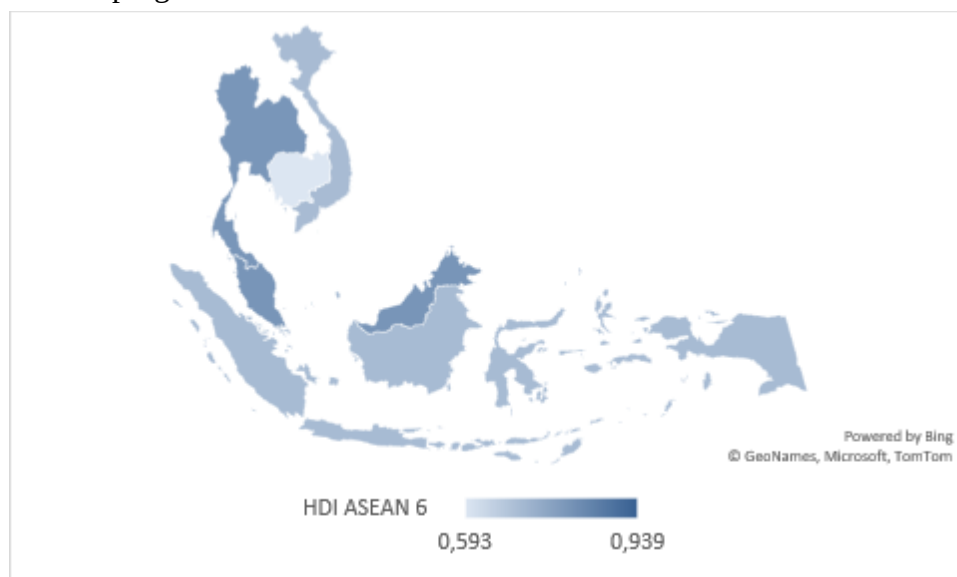


Figure 1. Human Development Index in ASEAN-6 Countries

Source: UNDP (2022)

ASEAN-6 countries (Indonesia, Malaysia, Thailand, Singapore, the Philippines, and Vietnam) exhibit differences in education expenditure and their corresponding Human

Development Index (HDI) outcomes. National development is measured not only by economic growth or per capita income but also by improvements in people's quality of life. The Human Development Index (HDI), developed by the United Nations Development Programme (UNDP), assesses development performance through three key dimensions: education, health, and a decent standard of living (Viddy et al., 2019).

Southeast Asia, particularly the ASEAN-6 countries, has become an important focus of human development policies. ASEAN, established in 1967, promotes political, economic, and social cooperation among its member states (UNDP, 2014). As the region's largest and most economically active economies, ASEAN-6 countries have implemented fiscal policies aimed at improving human development and achieving sustainable economic growth (OECD, 2022; *Human Development Report*, 2022).

According to Ranis et al. (2000), human development and economic growth reinforce one another. Improvements in education, health, and living standards stimulate sustainable economic growth, whereas economic growth without adequate social investment tends to produce unequal development outcomes. Despite differences in development levels and policy challenges, ASEAN-6 countries have generally achieved significant progress in improving human well-being.

Recent studies indicate that government expenditure on the health sector has a positive and significant effect on HDI, while education expenditure generates positive outcomes only when supported by efficient budget allocation and effective implementation. Education spending primarily improves HDI through increased expected years of schooling, although regional disparities may reduce its overall effectiveness. In addition, countries with higher tax-to-GDP ratios generally achieve better HDI performance, and the effectiveness of public expenditure largely depends on institutional quality and fiscal transparency (Diep et al., 2024). Furthermore, improvements in HDI have been shown to contribute positively to banking stability across ASEAN economies (Hidayat & Shodroкова, 2023).

This study investigates how government expenditure on the health and education sectors influences HDI in ASEAN-6 countries during the 2012–2022 period. The analysis utilizes panel data obtained from the OECD, World Bank, and UNDP, employing panel regression analysis and classical assumption tests to ensure the robustness and reliability of the empirical findings.

Previous empirical studies have consistently shown that government expenditure on healthcare significantly improves life expectancy and reduces mortality rates, both of which are key components of the HDI health dimension; (Anyanwu, 2009; Gupta, 2020). Moreover, government investment in healthcare represents an important form of human capital investment that enhances labor productivity and indirectly contributes to income growth (Barro, 1996). Nevertheless, the effectiveness of healthcare spending depends not only on expenditure levels but also on efficient resource allocation, sound governance, and equitable access to healthcare services (Filmer & Pritchett, 1999).

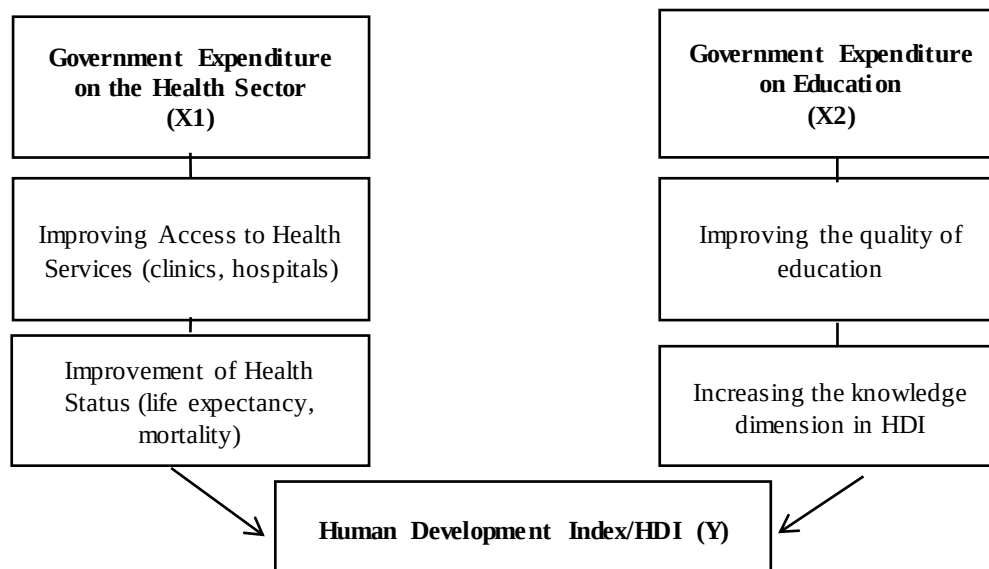
Government expenditure represents public spending allocated to provide public goods and services, with total expenditure reflecting budget decisions at national, provincial, and local government levels. During the early stages of economic development, government investment plays a crucial role in providing essential infrastructure, while at later stages it continues to stimulate growth alongside increasing private-sector investment (Puput Iswandyah Raysharie et al., 2023).

Education expenditure refers to financial resources allocated by governments or individuals to support the education sector (Harsono et al., 2024). Together with health and social assistance expenditures, education spending is considered a key determinant of human development (Kuala & Kuala, 2020). Although public expenditure on education is generally regarded as a strategic investment that improves HDI by increasing educational attainment and quality, its effectiveness largely depends on budget efficiency, equitable distribution across regions, and good governance. Regional disparities within ASEAN-6 countries may therefore weaken the overall contribution of education spending to HDI (Diep et al., 2024).

Previous studies further conclude that education expenditure does not always produce a significant improvement in HDI unless accompanied by efficient budget utilization and high-quality implementation. In many cases, healthcare and infrastructure spending exert a stronger influence on human development outcomes (Ekonomi & Pembangunan, 2023; Febrianto & Astrid Maria Esther, 2023). Likewise, although education expenditure contributes to increasing expected years of schooling, regional inequalities continue to reduce its overall impact (Diep et al., 2024). The United Nations Development Programme (2024) also reports that countries such as Singapore and Malaysia, which allocate relatively high education expenditure per capita, consistently achieve higher HDI levels, whereas Indonesia and the Philippines experience slower HDI growth due to lower budget efficiency.

Overall, the literature suggests that government expenditure on healthcare plays a fundamental role in promoting human development by strengthening social capacity. Meanwhile, government expenditure on education has the potential to improve HDI; however, its effectiveness depends on efficient budget allocation, equitable regional distribution, sound governance, and fiscal transparency. In addition, healthcare and infrastructure investment remain essential drivers of human development across ASEAN countries.

Research Transmission Scheme



Based on previous theory and research, this study concludes that government spending in the health sector has a positive and significant influence on HDI, while education spending has a positive but insignificant influence.

RESEARCH METHOD

This study aims to examine the analysis of the influence of government spending on the health and education sectors on the Human Development Index (HDI) in six major ASEAN countries (Indonesia, Malaysia, Thailand, the Philippines, Singapore, and Vietnam) during the period 2012–2021. The selection of these 6 ASEAN countries is based on their central role in the economy where there are differences in development levels and economic characteristics and are often used as study groups to observe economic and social dynamics in ASEAN which includes founding countries and major members that contribute significantly to the regional economy (Europarl, 2020). This study uses secondary data from annual time series from 2012 to 2021 obtained from Revenue Statistics in Asia and the Pacific (OECD), World Bank, UNESCO Institute for Statistics, and United Nations Development Programme (UNDP) as well as other references.

Table 1. Operational Definition of Variables

Variable	Definition	Unit	Source
Human Development Index (Y)	A composite index that measures a country's average achievement in three fundamental dimensions of human development: health, education, and standard of living.	Index	UNDP
Government Health Expenditure (X1)	The total allocation of government budget used to finance various public health programs and activities.	Percent	WHO
Government Education Expenditure (X2)	The allocation of funds from the national and regional government budgets used to support the education sector, including both formal and non-formal education.	Percent	UNESCO

Source: Compiler, (2025)

Panel Data Regression Model;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + e_{it}$$

Where α is a constant; Y is the Human Development Index (HDI); X1 is Government Expenditure in the Health Sector; X2 is Government Expenditure in the Education Sector; i is the cross-section; t is the time series; and e is the error term.

This study uses a descriptive quantitative approach and panel data regression based on secondary data. Data collection techniques are conducted through documentation, namely by collecting data from available and published official sources. This technique allows researchers to access cross-country (cross-section) and time-series data accurately and efficiently, in order to construct a panel dataset as a basis for statistical analysis. In this study, the model used will be determined based on the results of model specification tests, such as the Chow test and the Hausman test. To ensure the selection of the most appropriate model, a Common Effects Model (CEM)/Pooled Least Squares (PLS), Fixed Effects Model (FEM), and Random Effects Model (REM) are used.

RESULT AND DISCUSSION

Movement of the Human Development Index (HDI) Variable in ASEAN-6 Countries

The Human Development Index (HDI) is an important indicator used to measure a country's quality of life based on three main dimensions: health (a long and healthy life), education (knowledge), and a decent standard of living (income) (Human Development Report, 2022). ASEAN countries, as an economically and socially dynamic region, exhibit diverse HDI developments in accordance with their respective national capacities and policies. This analysis focuses on six ASEAN member countries: Malaysia, Singapore, Thailand, Cambodia, Vietnam, and Indonesia, from 2012 to 2021.

According to Figure 2, Singapore consistently has the highest HDI among the ASEAN-6 countries. The HDI increased from 0.920 in 2012 to 0.939 in 2021. This relatively small change indicates that Singapore is already in the very high human development category, and

further improvement is occurring gradually. This indicates stability in education, health, and living standards. Malaysia's HDI increased from 0.779 to 0.803, demonstrating a steady and consistent positive trend. This improvement reflects Malaysia's progress in health, education, and economic growth. While not as significant as Thailand or Cambodia, Malaysia is in the high human development category and is steadily approaching the very high development threshold.

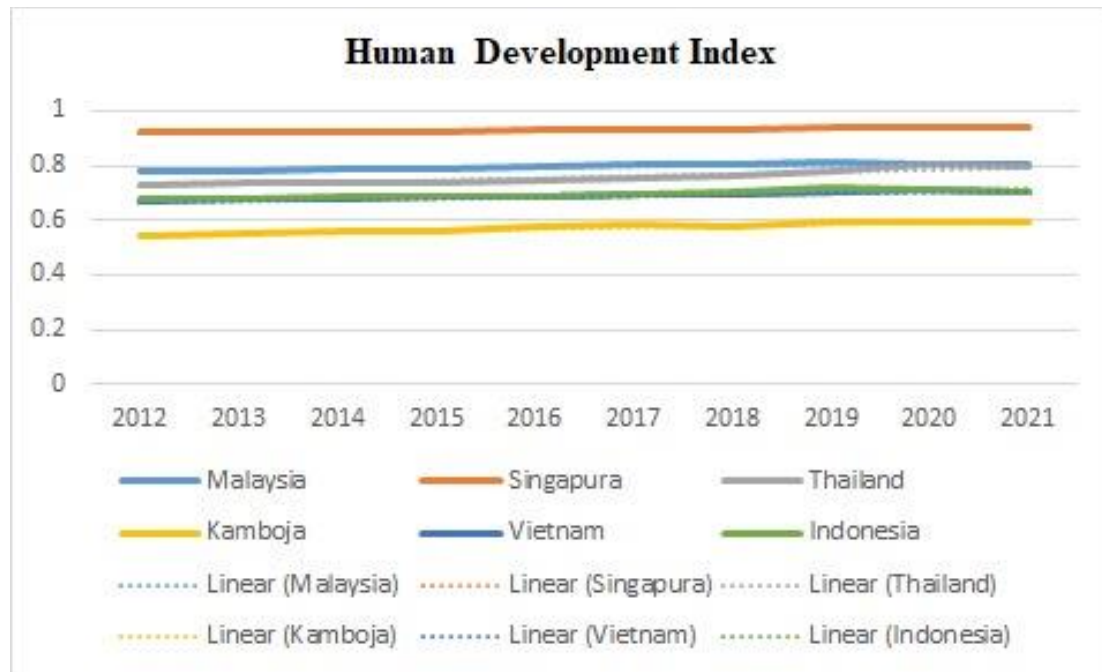


Figure 2. Chart HDI Variable Movement in ASEAN-6 Countries

Source: UNDP, (2022)

Thailand experienced a significant increase in its HDI from 0.733 in 2012 to 0.800 in 2021. This was the highest percentage increase among the ASEAN-6. This growth demonstrates successful efforts in human development, particularly in education and public health. Thailand has demonstrated strong social transformation over the past decade (Human Development Report, 2022).

Cambodia, despite having the lowest HDI among the countries analyzed, recorded relatively rapid growth, from 0.546 to 0.593. This 8.61% increase reflects rapid progress, despite a low starting point. This indicates significant improvements in access to basic services, but still leaves a large gap compared to its neighbors.

Vietnam experienced an HDI increase from 0.668 to 0.703, demonstrating a stable and positive trend. This moderate increase reflects Vietnam's success in maintaining consistent human development. Vietnam is now on the verge of achieving the high human development category, demonstrating success in inclusive social and economic policies.

Indonesia experienced an increase in its HDI from 0.677 to 0.705. This growth indicates a gradual but steady improvement in the quality of life of its people. This achievement

demonstrates the results of social infrastructure development, improved access to education, and improved healthcare services. The HDI, or HDI, is a measure of development success because it contains all the basic indicators of development success. The HDI serves not only as a benchmark for success in the region concerned, which can be used as a reference for future development planning, but also as a comparison with surrounding regions, allowing for mutually supportive program collaboration (Faqihudin, 2010). Regarding human development, a gap also exists between the western and eastern regions. In general, human development in the western region is more advanced than in the eastern region (Ummah, 2019).

All ASEAN-6 countries showed an upward trend in the HDI during the 2012–2021 period. Countries like Thailand and Cambodia show the highest relative growth, indicating successful development from their middle and low positions. Singapore and Malaysia are at high and very high HDI levels, reflecting mature development sustainability. Vietnam and Indonesia show consistent improvement, with significant potential to achieve even higher HDI levels in the near future (Human Development Report, 2022).

Movement of Government Expenditure Variables in the Health Sector in ASEAN 6 Countries

Government spending in the health sector plays a crucial role in improving people's quality of life. One way to measure this quality of life is through the Human Development Index (HDI), which consists of three main dimensions: health (life expectancy), education, and per capita income (United Nations, 2020).

Increased health budget allocations enable the development and maintenance of health infrastructure, the procurement of medical personnel, and the provision of higher-quality and more affordable services. This directly impacts life expectancy, reduced infant and maternal mortality rates, and the control of communicable and non-communicable diseases (World Health Organization, 2022).

According to Figure 3, health sector spending as a percentage of Gross Domestic Product (GDP) reflects a country's priority for health development. ASEAN 6 countries have shown varying trends in this budget allocation over the past decade.

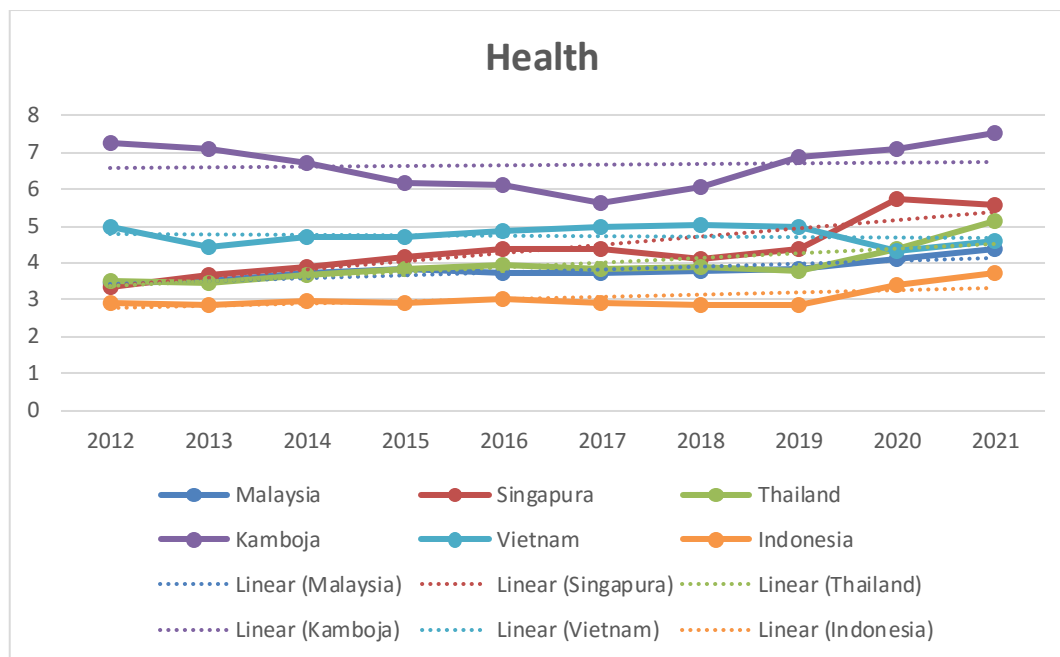


Figure 3. Chart Movement of Government Health Sector Expenditure Variables in ASEAN 6 Countries

Source: WHO, (2022)

Cambodia recorded the highest proportion of health sector expenditure to GDP, consistently above 6% and increasing from 7.26% (2012) to 7.53% (2021). This demonstrates a relatively strong commitment to health development, although the country's HDI remains relatively low, indicating challenges to the effective distribution of services (Human Development Report, 2022). Vietnam also demonstrated consistent spending, averaging above 4.5%, peaking at 5.03% (2018). This spending is in line with improvements in the country's health and education indicators.

Thailand experienced a gradual increase from 3.52% (2012) to 5.16% (2021), supporting the success of its internationally recognized universal health coverage system (World Health Organization, 2022). This contributes to Thailand's position as one of the countries with the highest HDI in the region. Singapore, despite being a developed country, recorded a significant surge in health spending, from 3.33% (2012) to 5.71% (2020) in response to the COVID-19 pandemic. This figure demonstrates the dynamic adaptation of fiscal policy to support the national health system.

Malaysia showed a steady increase, from 3.46% (2012) to 4.38% (2021). Strengthening the primary and secondary health systems is a key component of national development policy, positively impacting life expectancy and living standards. Meanwhile, Indonesia had the lowest proportion of health spending among the ASEAN-6, ranging from 2.87% to 3.71% during the period. Despite an increase following the launch of the National Health Insurance (JKN) in 2014, this allocation remains below the WHO standard, which recommends a

minimum of 5% of GDP (World Health Organization, 2022). This explains why Indonesia's HDI has improved more slowly than neighboring countries.

The graph of the movement of government health sector expenditure variables against the Human Development Index (HDI) is as follows: Government Expenditure in the Health Sector (GDP%) - Increasing Access & Quality of Healthcare Services - Improving Population Health (Life Expectancy) - Increasing Education & Productivity - Increasing HDI (Human Development Index).

Movement of Government Expenditure Variables in the Education Sector in ASEAN 6 Countries

Government expenditure in the education sector is an important indicator in assessing a country's commitment to human resource development and improving the quality of education. Ahsan & Haque (2017) argue that no country can achieve sustainable economic development without substantial investment in human capital. Education will encourage increased understanding and effectiveness in work, and improved education will enable individuals to use technology that can assist the production process.

Data on government expenditure on education as a percentage of Gross Domestic Product (GDP) in six ASEAN countries—Malaysia, Singapore, Thailand, Cambodia, Vietnam, and Indonesia—during the period 2012 to 2021 shows diverse dynamics. Each country faces different challenges and priorities in education budget allocation, as reflected in fluctuations and declining trends in the proportion of education expenditure to GDP in most countries. Analyzing this data movement is crucial for understanding the direction of education policy in the ASEAN region and its impact on the quality and access to education in the future (ASEAN, 2023).

According to Figure 4, Malaysia has consistently reduced the proportion of its education budget to GDP over the past decade. This significant decline occurred from 5.74% of GDP in 2012 to 4.26% in 2021. This decline may reflect budget efficiency, other policy priorities, or fiscal pressures. Singapore maintained stable education spending, ranging from 2.69% to 3.07% throughout the period, indicating a consistent and efficient policy in managing education funds.

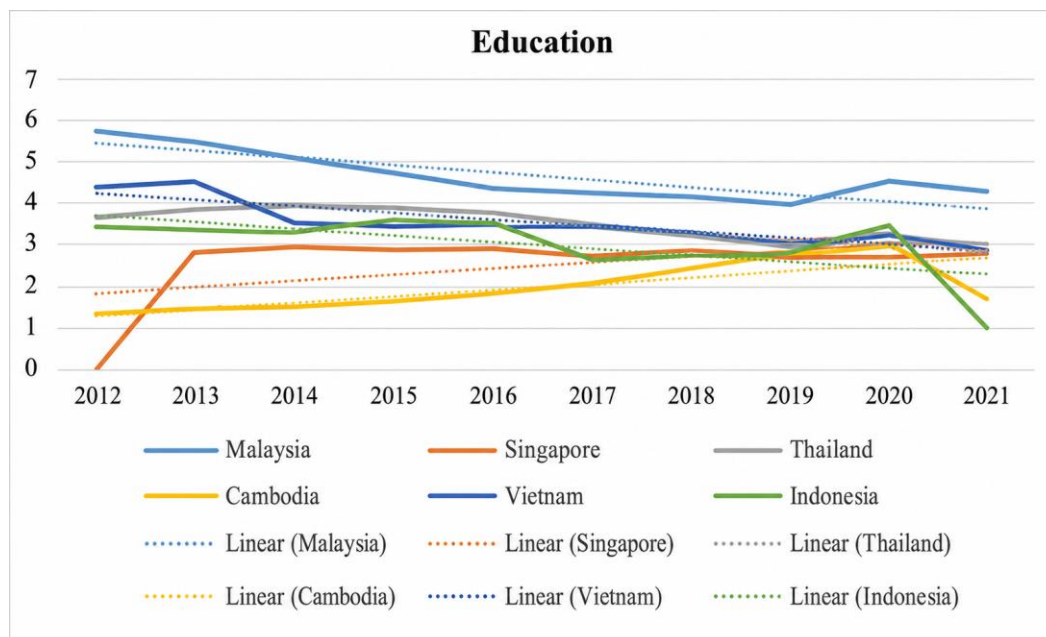


Figure 4. Chart Movement of Government Expenditure Variables in the Education Sector in ASEAN 6 Countries

Source: UNESCO, (2022)

Thailand experienced a fluctuating but declining trend, from 3.60% in 2012 to 2.98% in 2021. This gradual decline indicates an adjustment in the education budget, although it remains above 2.9% of GDP. Cambodia experienced a significant increase in the middle of the decade, rising from 1.41% in 2012 to a peak of 3.00% in 2020, then declining to 1.67% in 2021. This indicates the government's commitment to education, but there was a sharp decline in 2021, possibly influenced by fiscal pressures caused by the pandemic.

Vietnam experienced a downward trend, from 4.41% in 2012 to 2.95% in 2021. This decline indicates a reduction in the proportion of education spending to GDP, which could be due to changing budget priorities or faster growth in other sectors. Likewise, Indonesia showed the most drastic decline among the ASEAN-6, with a sharp decline from 3.41% in 2012 to 1.03% in 2021. This indicates a significant challenge in maintaining the proportion of the education budget to GDP, which can impact the quality and access to education.

This expenditure directly impacts the education components of the HDI:

1. Improving Access and Quality of Education: An adequate budget improves educational facilities, teacher availability, and curriculum quality.
2. Increasing Average Years of Schooling and Expected Years of Schooling: These two indicators are part of the HDI calculation. Good spending has a direct impact on increasing these figures.
3. Multiplier Effect: Better education boosts productivity, per capita income, and health awareness, which also impact the HDI.

Flow: Effective education spending → increased access and quality of education → improved education indicators → increased HDI.

Estimation Results

Descriptive Statistics

The average HDI value is 0.74, with a minimum value of 0.546 and a maximum of 0.939. However, the median HDI value is only 0.725, indicating unequal distribution of the data or the possibility of outliers. This is further supported by the relatively high standard deviation of 0.11, indicating significant variation between observation units.

For the variable Government Expenditure on the Health Sector, the average value obtained is 4.427, with a minimum value of 2.87 and a maximum value of 7.53. The median, which is nearly identical to the mean, at 4.08, indicates that the data distribution tends to be symmetrical. The standard deviation of 1.22 reflects moderate variation between observations. Higher tax revenues may reflect more economically developed regions, which allows for greater public spending and potentially increases the HDI.

Meanwhile, Government Expenditure on the Education Sector has an average of 3.25, with a minimum value of 1.03 and a maximum of 5.74. The median of 3.21 indicates a nearly symmetrical distribution, and the standard deviation of 0.95 indicates moderate variation in education spending allocations across units of analysis. Spending in the education sector is a long-term investment that contributes to human development. These differences can be an important explanation for disparities in the HDI between regions.

Table 2. Descriptive Statistics

Statistics	Human Development Index (HDI)	Government Health Expenditure	Government Education Expenditure
Mean	0.740967	4.427000	3.250000
Median	0.725500	4.080000	3.210000
Maximum	0.939000	7.530000	5.740000
Minimum	0.546000	2.870000	1.030000
Standard Deviation	0.111335	1.228265	0.952933
Observations	60	60	60

Source: Compiler, (2025)

There is significant inequality in the Human Development Index (HDI), with outliers at the highest values. Health and education expenditures are more stable, but still show variation across regions. The data supports the hypothesis that health spending and education budget priorities influence human development.

Multicollinearity Test Results

The multicollinearity test results indicate no significant multicollinearity issues between the Human Development Index (HDI), Government Expenditure in the Health Sector (KES), and Government Expenditure in the Education Sector (PND). The correlation values for each

variable are below 0.85, indicating a low correlation. Therefore, it can be concluded that multicollinearity is not a major issue in this study.

	HDI	KES	PND
HDI	1.000000	-0.455964	0.306904
KES	-0.455964	1.000000	-0.535885
PND	0.306904	-0.535885	1.000000

Source: Eviews, (2025)

Heteroscedasticity Test Results

The heteroscedasticity test results indicate no significant heteroscedasticity issues, as evidenced by all tested probability values being greater than 0.05 for all variables.

Dependent Variable : ABS(Resid)^2				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	46007.66	45764.32	1.005317	0.3183
KES	-224.9531	2594.631	-0.086699	0.9312
PND	7615.536	14279.56	0.533317	0.5955

Model Estimation Results

To determine the best panel data regression method, testing was first conducted using the Chow and Hausman tests. Based on the test results, the probability of the Chow and Hausman tests was below 0.05, thus selecting the Random Effects Model (REM) as the best model. The model estimation results, presented in Table 3, indicate that the constant value in the regression model is positive and significant.

The health sector expenditure variable shows a positive and significant effect on the HDI. This finding implies that any increase in government spending in the health sector will significantly increase the HDI index. Thus, it can be concluded that spending in the health sector has a positive and significant effect on the quality of human development in the ASEAN region.

Meanwhile, the education sector expenditure (EDS) variable has a negative coefficient of -0.007552 with a probability value of 0.0589, indicating it is not significant at the 5% level, but is significant at the 10% level. These results indicate that increased education spending does not necessarily contribute directly to an increase in the HDI in the short term, possibly due to factors such as spending efficiency, fund distribution, or the time required for the impact of education to be reflected in people's quality of life.

Table 3. Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.722833	0.025824	27.99074	0.0000
KES	0.009640	0.004281	2.252167	0.0286
PND	-0.007552	0.003910	-1.931624	0.0589
R-squared	0.984836	Adjusted R-squared		0.982794
F-statistic	482.4418	Prob(F-statistic)		0.000000
Chow Test				0.0000
Hausman Test				0.3988

Source: Compiler, (2025)

$$HDI = 0.722833 + 0.009640KES_{it} - 0.007552PND_{it} + e_{it}$$

The regression model produced an R-squared value of 0.984836, indicating that 98% of the variation in the Human Development Index (HDI) can be explained by the independent variables, namely government expenditure on the health sector (HEALTH) and government expenditure on the education sector (EDUCATION). Furthermore, the Prob(F-statistic) value of 0.000000 indicates that, jointly, government expenditure on the health and education sectors has a statistically significant effect on the Human Development Index (HDI).

Discussion

The Relationship between Government Expenditure on the Health Sector and the Human Development Index in ASEAN-6 Countries

The Human Development Index (HDI) is a composite indicator used to measure human development achievements across three fundamental dimensions: a long and healthy life, knowledge, and a decent standard of living (United Nations Development Programme, 2024). Government expenditure on the health sector reflects a country's commitment to improving public welfare while also serving as a fiscal instrument to promote social equity and enhance national productivity.

From the perspective of development economics, (Todaro & Smith, 2020) argue that development should not be viewed merely as economic growth but as a comprehensive improvement in people's quality of life, including better health, education, and social welfare. Government spending on healthcare is therefore one of the principal policy instruments for achieving these development objectives, as it directly strengthens human capital and contributes to improvements in the Human Development Index.

The estimation results of this study indicate that government expenditure on the health sector has a positive and statistically significant effect on the Human Development Index in ASEAN-6 countries. The estimated coefficient of 0.0096, significant at the 5% significance level, suggests that a 1% increase in government health expenditure (as a percentage of GDP) is associated with an increase of 0.0096 points in the HDI, *ceteris paribus*. This finding supports the hypothesis that greater government investment in equitable and accessible healthcare services enhances human development, particularly through improvements in life expectancy and overall health outcomes.

Theoretically, these findings are consistent with (Todaro & Smith, 2020), who emphasize that better health improves labor productivity, increases life expectancy, and strengthens long-term economic performance, all of which are reflected in higher HDI values. Countries with stronger healthcare systems generally have healthier populations that are better able to participate in education and economic activities.

Previous empirical studies also support these findings. For example, (Experiments, 2008) reported that higher government healthcare expenditure is closely associated with improved public health outcomes, including lower infant mortality rates and higher life expectancy—two important indicators within the HDI framework. Similarly, Anyanwu and Erhijakpor (2009) concluded that public health expenditure plays a significant role in improving health status and human development, particularly in developing countries.

Within the ASEAN context, countries such as Singapore and Thailand, which consistently allocate a larger share of GDP to healthcare than Indonesia and Cambodia, also record substantially higher HDI scores (United Nations Development Programme, 2024). This suggests that effective investment in preventive, promotive, curative, and rehabilitative healthcare services constitutes a strategic driver of human development.

Nevertheless, higher government expenditure alone does not necessarily guarantee better outcomes. The effectiveness of public spending largely depends on governance quality, healthcare delivery systems, institutional capacity, and the efficiency of resource allocation. Therefore, ensuring that healthcare budgets are allocated efficiently and targeted appropriately is essential for translating public expenditure into meaningful improvements in human well-being.

The Relationship between Government Expenditure on the Education Sector and the Human Development Index in ASEAN-6 Countries

Education constitutes one of the three principal dimensions of the Human Development Index, alongside life expectancy and a decent standard of living. Government expenditure on education reflects a country's commitment to developing human capital and improving overall human development (United Nations, 2020). ASEAN-6 countries differ considerably in both the scale and structure of education spending, contributing to variations in their HDI performance over the past decade.

From a theoretical perspective, increased government expenditure on education improves access to educational services, enhances teacher quality, and strengthens educational infrastructure. These improvements contribute to higher expected years of schooling and mean years of schooling, both of which are core components of the HDI (Barro & Lee, 2013). Public investment in education has long been recognized as a key driver of inclusive economic growth and sustainable development (“Overview: Learning to Realize Education’s Promise,” 2017).

Handalani (2018), in a study examining the determinants of the Human Development Index in ASEAN countries, found that government expenditure, economic growth, and

educational attainment significantly influence HDI. The study emphasizes that public policies aimed at improving the quality of human resources make a substantial contribution to sustainable development throughout the ASEAN region.

Malaysia has consistently allocated approximately 4–5% of GDP to education, helping maintain an HDI ranging from 0.70 to 0.80. Indonesia increased education expenditure from approximately 3.1% to 3.6% of GDP during the study period, accompanied by an increase in HDI from 0.677 in 2012 to 0.718 in 2021. Thailand allocated around 4% of GDP to education, while its HDI improved from 0.733 to 0.800. Vietnam maintained relatively high education expenditure, averaging 3.5–4.5% of GDP, with HDI increasing from 0.668 to 0.703. Cambodia, despite allocating only 1.4–3% of GDP to education, improved its HDI from 0.546 to 0.593. Singapore allocated approximately 2.6–3% of GDP to education yet consistently achieved an HDI above 0.93, largely because of the efficiency of its education system and the effectiveness of its public policies.

The analysis reveals a positive relationship between education expenditure and improvements in HDI across most ASEAN-6 countries. Nations that consistently invested larger proportions of GDP in education, such as Vietnam and Thailand, experienced notable improvements in the education dimension of the HDI. However, these findings also demonstrate that the effectiveness of public expenditure is more important than the size of the budget itself.

Singapore provides a clear example of how efficient budget allocation and strong educational policies can produce exceptionally high HDI outcomes despite relatively moderate levels of education expenditure. Conversely, Cambodia has achieved gradual improvements in HDI despite relatively limited education spending, suggesting that other factors—such as foreign assistance, broader economic growth, and expansion of informal educational opportunities—may also contribute to human development.

Overall, government expenditure on education plays a vital role in improving the Human Development Index, particularly through increases in expected years of schooling and mean years of schooling. However, this relationship is not strictly linear, as it is influenced by policy effectiveness, governance quality within the education sector, and broader socioeconomic conditions. Consequently, ASEAN countries should focus not only on increasing education budgets but also on ensuring that these resources are allocated efficiently, managed transparently, and distributed equitably to support high-quality education and inclusive human development.

CONCLUSION

Conclusion

Government expenditure on the health sector has a positive effect on the Human Development Index (HDI). Countries with stronger fiscal capacity, such as Singapore, Malaysia, and Thailand, tend to achieve higher and more stable HDI levels.

Government expenditure on the education sector also has a positive impact on HDI. Countries that consistently allocate a relatively large proportion of their Gross Domestic Product (GDP) to education, such as Vietnam and Thailand, have experienced more substantial improvements in HDI, particularly in the education components of expected years of schooling and mean years of schooling.

The effectiveness and efficiency of public expenditure are key determinants of development outcomes. Although Singapore allocates a smaller percentage of its GDP to education than several other ASEAN countries, it consistently records the highest HDI in the region. This finding demonstrates that good governance, well-targeted public policies, and continuous innovation play crucial roles in maximizing the returns from public investment.

Differences in the impact of government expenditure across ASEAN-6 countries reflect variations in economic structure, fiscal capacity, institutional quality, and education systems. Lower-income countries such as Cambodia have also achieved improvements in HDI despite fiscal constraints, suggesting that external support and program efficiency contribute significantly to human development outcomes.

Overall, the combination of effective government expenditure on health and education contributes substantially to improvements in the Human Development Index. Public expenditure provides the financial resources needed to strengthen human capital, while investments in health and education serve as the primary channels through which these resources are transformed into sustainable human development.

Policy Recommendations

Based on the findings that government expenditure on the health sector has a positive and statistically significant effect on HDI, ASEAN governments—particularly those with relatively lower HDI levels, such as Indonesia and Cambodia—should consistently increase the proportion of GDP allocated to healthcare. Priority should be given to primary healthcare services, maternal and child health, the expansion of healthcare facilities in underserved and remote areas, and long-term investments in human development.

Government expenditure on education should focus on improving educational quality through investments in teacher competence, relevant curricula, and adequate educational infrastructure. Regular monitoring and evaluation of education programs should be conducted to ensure that budget allocations improve not only access to education but also learning outcomes.

Beyond increasing budget allocations, improving the efficiency and effectiveness of public spending should remain a major policy priority. Health financing reforms should strengthen monitoring and evaluation systems to ensure that healthcare expenditure translates into measurable improvements in public health and overall quality of life.

ASEAN-6 countries are also encouraged to develop comprehensive data-driven monitoring and evaluation systems that enable transparent assessment of the effectiveness of public expenditure. Strengthening national statistical systems would support evidence-based

policymaking and improve governments' ability to respond to emerging development challenges.

Furthermore, governments should promote policy innovation and the digitalization of public services to address contemporary challenges such as digital transformation, social inequality, and climate change. The adoption of digital technologies can improve administrative efficiency, expand access to education, and enhance learning experiences.

Finally, ASEAN should strengthen regional cooperation in fiscal reform, education policy, and human development initiatives. Countries with higher HDI performance should share best practices and technical expertise with member states that continue to face challenges in improving human development indicators, thereby promoting more inclusive and sustainable development across the ASEAN region.

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