

Government Spending on Education and Its Relationship with the Human Development Index: The Case of the Philippines and Singapore

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Abstract - This study examined the relationship between government spending on education as percentage of the GDP and Human Development Index (HDI) in the Philippines and Singapore over a 13-year period from 2009-2021. The study aimed to determine the trend of the government expenditure to education and the HDI of the a developing and a developed country and how educational investment influenced the human development outcomes in these two Southeast Asian countries. Data from various sources such as, World bank, Trading Economics, and United Nation Development Programme (UNDP) were analyzed descriptively. The GNU Regression, Econometrics and Time-Series Library (GRETL) as statistical software was used in data analysis particularly in determining the relationship between the independent and dependent variables. The Philippines experienced fluctuating spending from 2010 to 2017, with a decline post-2017, while Singapore's education budget was more stable, with a gradual increase around 2013, followed by a decline, stabilization between 2014 and 2018, and a slight rebound in 2021. The trend of Human Development Index in Philippines and Singapore in the period of 2009 to 2021, generally increased, indicating social and economic development. Lastly, the regression results indicate a significant relationship between government spending on education and the Human Development Index (HDI) in the Philippines and Singapore. Governments in both countries specifically the Philippines is encouraged to collaborate with international organizations and develop long-term plans to address different issues on enhancing the country's HDI through education expenditures.

Keywords – human development index, gross domestic product, expenditure in education, relationship of HDI and DGP

INTRODUCTION

A rising GDP, booming industries, and strong trade figures are factors in achieving progress of a country. But real development isn't just about money—it's about people. How long they live, the education they receive, and their overall well-being matter just as much, if not more. That's where the Human Development Index (HDI) comes in. Created by the United Nations Development Programme (UNDP), HDI shifts the focus from wealth to quality of life, measuring a country's success through life expectancy, education, and standard of living.

One of the biggest drivers of human development is education. It's not just about schools and textbooks—it's about shaping the future. A well-

educated population means a skilled workforce, innovation, and stronger economies. But when schools lack teachers, resources, and modern learning tools, a country's progress slows down. Studies have shown that nations struggling with poor education and healthcare find it much harder to improve their HDI scores (Astri et al., 2013).

Despite how crucial education is, many Southeast Asian countries don't invest enough in it. On average, ASEAN nations allocate only about 4% of their GDP to education (OECD, 2022; UNESCO BANGKOK, 2022). This leads to teacher shortages, outdated materials, and limited technology in classrooms. But does spending more education omatically improve

education? It's not always that simple. Some studies suggest that additional funding isn't always well-spent (Khafid & Rhiana, 2022), while others show a clear link between investment and better outcomes (Hanum & Gasani, 2020).

Looking at the bigger picture, human development has been improving worldwide. South Asia saw a 46% rise in HDI between 1990 and 2018, with East Asia and the Pacific close behind at 43% (UNDP, 2019). Thailand, for example, jumped 12 ranks in just five years. Indonesia and the Philippines have also moved into the "high human development" category, showing real progress in health, education, and income.

But not every country is advancing at the same pace. The gap between developing and developed nations remains wide. Take Singapore and the Philippines—both in Southeast Asia, yet worlds apart economically. Singapore, a global powerhouse, can afford to pour resources into education, while the Philippines faces financial constraints that make progress more difficult.

Human development isn't just about government policies—it shapes businesses, too. Countries with high HDI scores have healthier, better-educated workforces, leading to increased productivity and economic growth. In turn, businesses thrive when people have the education and resources to contribute meaningfully. Companies also play a role in this cycle, investing in education and workforce training through corporate social responsibility (Surmanidze & Beridze, 2023).

A study comparing the Philippines and Singapore (2009–2021) explored how education funding impacts development in a developing versus a developed nation. However, it had limitations—it didn't look at infrastructure, income inequality, or cultural influences, all of which also shape human development.

Despite its flaws, the HDI remains one of the most widely used tools for understanding national progress. At the end of the day, real development is about investing in people. Whether it's through better schools, healthcare, or economic opportunities, putting people first is the surest way to build a better future—for nations, businesses, and individuals alike.

Human Development

Human development isn't just about economic success—it's about people. It's about giving individuals the opportunities, freedoms, and well-being they need to live fulfilling lives. While income growth is important, it should be a means to improve lives, not the only measure of progress. True development means ensuring access to healthcare, quality education, and a decent standard of living. It also means protecting human rights, political freedoms, and dignity (Kumar, 2015).

The idea of human development isn't new. It has been around since the 19th century and became a major focus for global organizations like the UN and the World Bank in the mid-20th century. These organizations realized that a nation's success isn't just about wealth—it's about how people live, the choices they have, and the freedoms they enjoy (Correa, 2024).

At its heart, human development is about giving people real opportunities to achieve their goals and make meaningful contributions to society (Mihaela & Oana-Georgiana, 2015; Alkire, 2022). Experts believe that lasting progress depends on prioritizing people's well-being (Anand & Sen, 2000; Ranis et al., 2000; Ülengin et al., 2011).

But how do we measure human development? The Human Development Index (HDI) is a widely used tool that assesses education, health, and living standards. However, it has been criticized for not considering political freedoms and social participation (Fukuda-Parr, 2002). Despite its flaws, HDI remains one of the most recognized indicators of progress.

The UNDP (2015) emphasizes that improving people's lives should be the real goal of development—not just relying on economic growth. Economist Amartya Sen (2000) pointed out that traditional measures like GNP don't fully capture what truly matters—freedom, healthcare, and education. Similarly, Mahbub Ul Haq, the founder of the Human Development Report, argued that economic performance should not overshadow human well-being.

Economic growth and human development are deeply connected. When people have better

opportunities and access to resources, economies thrive. In turn, economic growth can expand people's choices and improve their quality of life. Dreze & Sen (2002) showed that even lower-income nations can boost human development with smart policies.

Vietnam and the Philippines offer a real-world example of how policies impact human development. Since 1986, Vietnam's market liberalization, land reforms, and investments in health and education have led to rapid, inclusive growth. Economic success translated into better lives for its people. In contrast, the Philippines faced challenges like elite-controlled resources, weak infrastructure, and an inefficient tax system, which resulted in slower, less inclusive growth (Baulch, 2016).

At the end of the day, human development is about people, not just numbers. While economic growth can help, real progress happens when individuals have the freedom, resources, and opportunities to build better lives for themselves and their communities.

To track this progress, the UNDP created the HDI, which evaluates a country's performance in health, education, and living standards (UNDP, 2018a). Unlike traditional economic indicators, the HDI gives a broader, more accurate picture of human well-being.

Why HDI Matters

The Human Development Index (HDI) helps us understand a country's overall quality of life. It goes beyond just measuring income, taking into account education, life expectancy, and social stability (Dasic B., 2020). Alzahrani (2018) describes it as a well-rounded way to assess national success. While some have criticized the HDI over the years (Choi et al., 2011; Tan, 2022), the UNDP has continued refining it to keep it relevant.

Since 1990, the UNDP has stressed that true development should focus on people, not just economic numbers. The first Human Development Report put it simply: "People are the actual wealth of nations" (Ferjan, 2014). This marked a shift from seeing success purely in terms of income to prioritizing well-being. Studies confirm that countries with lower HDI scores tend to struggle with lower productivity, higher poverty, and weaker economic

stability (Riana & Khafid, 2022), making a strong case for policies that put people first.

Challenges in Southeast Asia

Despite impressive economic growth, many Southeast Asian countries still face major hurdles in human development. As Bhowmik (2023) points out, globalization has strengthened economies, but investment in education and healthcare hasn't always kept pace. ASEAN's long-term economic strength depends on a well-educated, skilled workforce, yet HDI growth often trails behind GDP gains. Researchers (Biagi et al., 2017; Croes et al., 2020; Fu et al., 2020) emphasize that HDI is a key indicator of progress, reflecting improvements in life expectancy, education, and living standards.

In terms of Southeast Asian nations ranks in HDI, Singapore (0.925) and Brunei (0.865) are very high; Malaysia (0.789) is high, ranking 59th globally; Thailand, the Philippines, Vietnam, Cambodia, Laos, Indonesia ranked medium; and Myanmar ranked low (Sadeka et al., 2018). The Philippines has made steady progress, increasing its HDI from 0.598 in 1990 to 0.699 in 2021 (Ramachandran, 2024). Cambodia's HDI reached 56.9% in 2023, ranking 146th out of 191 countries (Chaker, 2024). While several Southeast Asian countries have made it into the top 100 in human development, Singapore and Malaysia saw slight declines, and Vietnam still falls in the medium HDI category. These trends highlight the ongoing need to invest in education, healthcare, and overall human capital.

At its heart, human development is about giving people the resources and opportunities they need to thrive. Economic growth is valuable, but it isn't enough on its own. Nations must focus on education, healthcare, and strong social systems to make sure economic progress translates into real improvements in people's lives. When governments invest in their people, they build stronger, healthier, and more resilient societies—ensuring that progress benefits everyone, not just a select few.

Influence of Education Sector to Human Capital Development and Human Development Index

Human capital is all about the skills, education, and abilities that help people work more effectively and boost productivity (Serrat, 2017). It's a key part

of human resource management, as developing knowledge and skills helps individuals and businesses grow. In many ways, employees are like investments—when they learn and improve, their value increases over time.

A well-trained workforce is the backbone of a strong economy. Skilled workers contribute more, helping businesses expand, increasing exports, and even boosting remittances when people work abroad. Education is especially important for those in lower-income groups, as those with fewer skills often earn less (Almendarez, 2013). Instead of seeing employees as expenses, human capital recognizes them as essential to progress. However, productivity naturally decreases with age, making continuous workforce development a priority.

Education policies play a crucial role in human capital, with the Human Development Index (HDI) tracking progress in health, education, and living standards. The World Bank (2007) highlights how long-term economic growth depends on strong education systems, with initiatives like Education for All (EFA) pushing for universal access to learning. Yet, many developing nations still struggle with challenges such as debt and financial aid reliance.

The World Bank's Human Capital Index shows how education and health shape economic success. Theories like endogenous growth highlight the need for both internal and external investments in people. Even in difficult times—such as during the COVID-19 pandemic—countries recognize that prioritizing human capital is key to recovery and development.

Research confirms that education—especially increasing school enrollment—directly fuels economic growth. Livingstone (1997) stresses that it's not just about getting more people into classrooms but ensuring they receive quality education. Ram (2004) notes that foreign aid can help countries build strong education systems, reduce poverty, and drive economic progress. Many studies affirm the vital role human capital plays in long-term growth (Absar et al., 2021; Ayittey et al., 2020; Dhar et al., 2021; Amin, 2020; Islam & Alam, 2019).

Good health, social stability, and economic policies all contribute to human capital (Sodirjonov).

A healthy population forms the foundation of productivity, while skill development enables individuals to contribute meaningfully to society. Education isn't just a personal advantage—it's the engine that drives social and economic progress.

In South Asia, improving education and workforce skills is essential to keeping up with more developed economies. Barro & Lee (2015) emphasize that human capital is a major driver of global productivity and rising incomes. Studies in Sub-Saharan Africa (Johansson, 2015) and China (Ying & Liu, 2016) show that longer life expectancy and better education have a direct impact on economic growth.

Technology and education go hand in hand (Asian Development Bank, 2017). However, South Asia faces difficulties in training workers to compete with countries like South Korea and China. Investing in education strengthens economies, reduces poverty, and raises living standards (Atmanti, 2017).

Some regions are already seeing the benefits. In West Sumatra, prioritizing education has lowered unemployment and increased incomes (Aminah, 2019). Investing in education improves HDI scores by creating better jobs and higher wages. Wagner's Law suggests that as economies grow, governments spend more on education. Between 2015 and 2018, Indonesia saw a clear link between education investments and improvements in HDI (Wafa, Mukhtar, & Wiralaga, 2022).

Singapore's education system is a model for preparing students for the workforce (Nithyavathy, 2024). Across various regions, governments are now working to provide 12 years of free, high-quality education to equip students with both scientific knowledge and practical skills (Diba et al., 2018).

In the Philippines, HDI data highlights the need for improvements in graduate education. Lower HDI scores reveal gaps in faculty quality, research opportunities, and educational resources (Minimo et al., 2024). Expanding graduate programs and research not only drives innovation but also strengthens the economy by making higher education more accessible.

At its core, education shapes both individual lives and entire societies. By committing to lifelong learning and quality education, governments can unlock human potential, break cycles of poverty, and build a more prosperous and fairer future for everyone. Education is a transformative force that drives human development. A well-educated workforce not only strengthens the economy but also makes government investment in education crucial (Atmanti, 2017). By increasing public funding for education, we can boost productivity, improve living standards, and tackle poverty.

In West Sumatra, focusing on education has reduced unemployment and raised incomes. Skilled workers earn better wages, which in turn lowers poverty and increases tax revenue (Aminah, 2019). Education doesn't just create jobs—it uplifts communities and raises the Human Development Index (HDI), improving quality of life for everyone.

Wagner's Law suggests that as an economy grows, government spending on welfare, including education, grows as well. Between 2015 and 2018, Indonesia saw the direct benefits of investing in education, with improvements in HDI (Wafa, Mukhtar, & Wiralaga, 2022). Singapore has built an education system that successfully prepares students for the workforce, ensuring they can meet the needs of a fast-growing economy (Nithyavathy, 2024). Likewise, local governments across the globe are now aiming to offer at least 12 years of free, high-quality education, which helps students gain both scientific knowledge and practical skills (Diba et al., 2018).

In the Philippines, the latest HDI results show a need for improvements in graduate education, such as better faculty, research opportunities, and resources (Minimo et al., 2024). Investing in graduate programs and research will foster innovation, fuel economic growth, and produce a more skilled, competitive workforce.

At every stage, education shapes lives, communities, and entire economies. When governments invest in quality education and promote

lifelong learning, they unlock human potential, reduce poverty, and pave the way for a more equitable future.

This study examined the trend of the Philippine and Singapore's expenditure on education as percentage of their individual annual GDP from 2009 to 2021, and the trend of the two countries' poverty rate on the same period. The relationship between these two variables, the independent and dependent variables, respectively was determined for each of the two countries. The findings stressed the importance of allocation of budget to education to enhance HDI or to sustain ideal human development index.

METHODS

The researchers used a quantitative approach with a descriptive-correlational method to achieve the study's objectives. The descriptive approach helped summarize the data, while the correlational method was applied to explore the relationship between the dependent and independent variables. The data was visually presented through simple graphs, laying the groundwork for quantitative analysis.

To gather the data, the researchers relied on secondary sources, including Trading Economics, the World Bank, and the United Nations Development Programme (UNDP). They looked at government spending as a percentage of GDP in the Philippines and Singapore to assess their Human Development Index (HDI). HDI data for both countries came from the UNDP, ensuring the information was reliable from trusted sources.

Data Analysis

This section outlines the tools used to analyze the data. The researchers gathered data online, processed it, and presented the results both in graphs and written form. The first research question was descriptive, focusing on government spending on education in the Philippines and Singapore from 2009 to 2021. This data was shown in a linear chart to illustrate trends and changes over time. Analysis for the second question also used descriptive analysis. Secondary data from online sources was collected to track HDI trends between 2009 and 2021, also displayed through a linear chart. To answer the third research question, which explored the connection between education spending and HDI, the researchers used correlation

analysis. They utilized GRET software, a tool for GNU Regression, Econometrics, and Time-series Analysis, to perform Ordinary Least Squares (OLS) regression. The software also helped formulate the regression equation and create a scatter plot to visualize the relationship between the two variables.

The following formula shows the hypothesized relationship between the dependent variable (HDI) and the independent variable (government spending on education in the Philippines and Singapore).

$$HDI = \beta_0 + \beta_1 (GSE) + e$$

Where in:

HDI – Human Development Index

GSE – Government Spending on Education

β_0 – constant term

β_1 – regression

Coefficient/slope

e – standard error

RESULTS

Table 1 illustrates the trend in government spending on education as part of GDP in the Philippines and Singapore from 2009 to 2021. It highlights the trends in education funding over the years for each country, showing periods of increase or decrease. Each country is represented by a different colored line, making it easier to compare their spending trends over time. The spending generally increases over the years for most countries, indicating a growing investment in education.

During the year 2010 to 2017, the Philippines experience fluctuations during this period. There were peaks around this period indicating periods of increased in investment. However, after the year 2017, there was a noticeable decline in the Philippines' education budget. According to the Department of Budget and Management (DBM), in 2018, the Philippine government reallocated over PHP 100 billion from the Department of Education (DepED) to the Department of Public Works and Highways (DPWH). This transfer was aimed at constructing additional school facilities for the K to 12 program and was part of the Basic Education Facilities Fund (BEFF), which is an annual budget dedicated to school building programs. Further, in year 2019 to 2021, the education budget also declined probably due to the influence of COVID -19

pandemic, causing a significant disruptions and leading many governments, including Philippines, to reallocate funds to address urgent healthcare needs and economic recovery efforts.

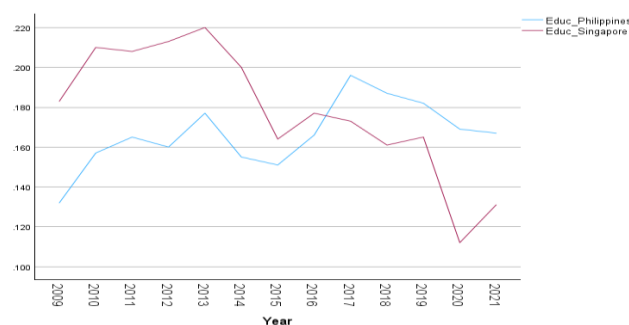


Figure 1. Line Chart of Government Spending on Education in the Philippines and Singapore, 2009-2021

Source: World Bank and Trading Economics

According to UNESCO (2022), the expenditure on education has increased from 2015 to 2019 by 8.9% and decreased by 33.3 % from 2019 to 2020. This decline is probably caused by the COVID-19 pandemic affecting the proclaimed budget on national expenditures beforehand. Regardless of the decline in expenditure in 2019, the allocated funds for public education in the Philippines did not deteriorate further yet it continued until the year 2020.

On the other hand, Singapore's spending on education is more stable than Philippines, with a gradual increase around 2013. However, after 2013, there is a noticeable decline, indicating a possible shift in budget priorities. In the year 2015, the Singapore's government spending increased on public transport and other social development areas, which impacted the allocation for education. The National Archives of Singapore entitled "Analysis of Revenue and Expenditure facial Year 2015", highlights the main increases of government spending which are focused in transport, culture, health care, defense and home affairs, and community and youth. In terms of transport, its expenditure is expected to increase by 80.6% which catered the development of Changi Airport and expansion of rail networks like Downtown Line, Thomson-East Coast Line and Tuas West Extension.

Further, expenditures for culture, community and youth is expected to increase by 39.8% considering

the national events that took place in Singapore including SEA Games and ASEAN Para Games together with the development of community facilities such as Singapore Chinese Culture Centre and Tampines Town Hub. Alongside, between the year 2014 and 2018, the spending stabilizes with minor fluctuations, indicating a period of steady investment. After 2018, there is another decline that is expected to continue until 2021 that maybe caused by various factors including economic challenges.

As reported by the World Bank, from 2018 to 2021, the Philippines saw a consistent decline in its total percentage of spending on education. In the year 2017, the spending was 18.7%, but it gradually declined each year reaching 16.7% in 2021. As for Singapore, year 2018, the spending was 17.3% of the budget, marking a slight decline of 1.2% in 2018. However, in the year 2020, there was a significant drop of 5.3%, reducing the expenditure to 11.2%, but in 2021, the spending rebounded to 13.1% marking a 1.9% increase from 2020. On the other hand, figure 2 depicts statistics in the Human Development Index of the Philippines and Singapore from 2009 to 2021. It is a measure of countries' levels of social and economic development. The graph shows that the two countries encountered diverse changes from its HDI scores across a decade.

According to UNDP (2024), the Philippines has a lower HDI percentage compared to Singapore. In the Philippines, it started with a moderate low HDI in 2009 which is 0.666 due to its slow growth. Lim (2020) stated that the Philippines' low HDI growth in comparison to a few Asian nations is made worse by stark regional differences, with many impoverished provinces and areas falling behind in terms of economic development and poverty alleviation. Despite of having a low HDI percentage, through the years the country experienced a steady rise of HDI and notable improvement.

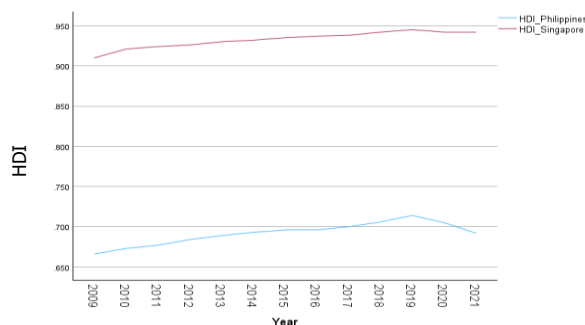


Figure 2. Line Chart of Human Development Index in the Philippines and Singapore, 2009 -2021

Source: UNDP

The Philippines' economy has been one of the most vibrant in East Asia and the Pacific, according to the World Bank (2024). It's driven by a strong labor market, significant remittances, urbanization, a youthful population, and growing consumer demand. The private sector, especially the booming services industry like business process outsourcing, retail trade, and tourism, has kept thriving. However, the COVID-19 pandemic caused a noticeable dip in the country's Human Development Index (HDI) between 2020 and 2021, highlighting the serious impacts of the crisis.

The Philippines Institute for Development Studies (2022) explains that the pandemic had a severe impact on both the culture and economy of the country. The economy shrank by about 9.5 percent, the largest drop since 1947 (PSA 2021a), throwing the country into a recession in 2020. Lockdowns, especially in the National Capital Region, caused business closures and halted vital economic activity. As a result, the unemployment rate shot up from 5.1 percent in April 2019 to 17.7 percent in April 2020, leaving around 7.3 million Filipinos jobless. Despite this setback, the Philippines' HDI still rose from 0.598 in 1990 to 0.699 in 2021, keeping it in the medium human development category (UNDP, 2024).

The drop in HDI can be attributed to several factors, including persistent health issues. Montes et al. (2019) point to challenges such as limited healthcare access in marginalized areas and high maternal mortality rates. On the other hand, Singapore has consistently had a higher HDI than the Philippines, starting at 0.910 in 2009 and peaking at 0.942 in 2021. The small fluctuations in Singapore's HDI reflect a stable and well-established system with

minimal dramatic changes. Singapore's strong economy is supported by investments in public services, education, healthcare, infrastructure, and a business-friendly environment. As a result, it remains one of the most competitive economies globally and ranked first in the 2020 World Bank Human Capital Index (World Bank, 2024).

Anisha and Devanshi (2022) point out that Singapore's impressive HDI score comes from a highly effective education system and healthcare services. However, the country's growth has been driven more by the efficient use of human resources than by GDP alone.

Regression Results

Table 1 below shows the regression results of the relationship between independent variable which is government spending on education as percentage of GDP, and the dependent variable Human Development Index in the Philippines and Singapore.

Table 1. Heteroskedasticity-Corrected Result of Government Spending on Education and HDI in the Philippines, 2009 to 2021

	<i>Coefficient</i>	<i>Std. error</i>	<i>t-ratio</i>	<i>p-value</i>	
Constant	0.591539	0.008740	67.68	9.10e-16	***
Independent_GSE	0.564207	0.216598	8.522	3.44e-06	***
Dependent Variable: HDI_Philippines r squared: 0.869267 P-value (F): 3.44e-06 Adjusted r-squared: 0.857382 F (1,11): 73.14075					

Note: * " $p < 0.05$ "

The regression equation was generated with the help of GNU Regression, Econometrics and Time-Series Library (GRET). In the Philippines, based on the heteroskedasticity-corrected result, it was shown that for every 1% increase in the education budget allotment vis-à-vis the national budget, the HDI will increase by 0.591539. The coefficient determination test shows the level of accuracy of the relationship between independent and dependent variables.

Furthermore, the value of adjusted r-squared is 0.857382 which indicates that every increase in government spending on education will likely result in a 85.7% increase in HDI. This implies that the HDI of the Philippines is dependent on the allocated budget for education. Therefore, there is a positive and significant relationship between government spending on education on the HDI. The p-value is 3.44e-06 which is less than the significance level of 0.05,

indicating that the null hypothesis was rejected since there is significant relationship between government spending on education and HDI in the Philippines.

Del Prado and Galan (2019) assess the influence of education on the HDI rankings in the Philippines. It has been noticed that improvements in education indicators have a positive impact on the country's HDI score. Through the right allocation of expenditures and public sector development, it is identified that government spending has a significant effect on the Human Development Index (Mahendra, 2020).

From the regression result of Table 1, the regression equation of the Philippines' government spending on education and its relationship with HDI was given below:

$$\text{HDI} = 0.591539 + 0.564207 (\text{GSE}) + e$$

Table 2. Heteroskedasticity-Corrected Result of Government Spending on Education and HDI in Singapore, 2009 to 2021

	<i>Coefficient</i>	<i>Std. error</i>	<i>t-ratio</i>	<i>p-value</i>	
Constant	0.96028	0.005535	173.5	2.93e-20	***
Independent GSE	-0.15552	0.037616	-4.135	0.0017	***
Dependent Variable: HDI_Singapore r squared: 0.608475 P-value (F): 0.001659 Adjusted r-squared: 0.572882 F (1,11): 17.09526					

Note: * “p<0.05”

The regression equation was generated with the help of GNU Regression, Econometrics and Time-Series Library (GRET). In Singapore, the value of the coefficient estimate is -0.155529, which indicates that for every 1% increase in the education budget allotment vis-à-vis the national budget, the HDI is expected to decrease by 0.960289, while all other factors are constant. This implies that there are other factors that affects their HDI aside from government spending on education. The value of adjusted r-squared in the HDI regression equation is 0.572882, which implies that the government spending on education explains 57.2% of the variation in the Human Development Index of Singapore. This denotes that the remaining 43% of the HDI were attributed in different factors. However, this suggests that there is a strong relationship between the variables.

Further, the p-value associated with this coefficient is 0.0017, which is less than the significant level of 0.05, indicating that the null hypothesis was rejected since the independent variable, the government spending on education has a significant relationship the Human Development Index.

According to Edeme (2014), government spending on health, education, and infrastructure significantly affects the HDI. However, on certain research conducted by Prasetyo & Zuhdi (2013), they found out that there is no significant effect of government spending on the HDI, and the expenditures is not always efficient in improving the HDI.

From the regression result of Table 2, the regression equation of Singapore’s government spending on education and its relationship with HDI was given below:

$$\text{HDI} = 0.0960289 - 0.155529 (\text{GSE}) + e$$

CONCLUSIONS AND RECOMMENDATIONS

From 2010 to 2017, the Philippines experienced fluctuating education spending, with peaks indicating increased investment. After 2017, education spending declined, likely due to the COVID-19 pandemic forcing funds to be redirected to healthcare and economic recovery. By 2021, education spending dropped from 16.7% of budget allotment on education compared in 2017 which is 19.6%.

Meanwhile, Singapore’s education budget was more stable, with a gradual increase observed around 2013, but a decline followed after that, suggesting shifting budget priorities. Between 2014 and 2018, spending stabilized with minor fluctuations. After 2018, a significant drop occurred, especially in 2020, but it rebounded slightly in 2021. Both countries faced challenges, but Singapore showed greater resilience in managing its education investments.

The trend of Human Development Index in the Philippines and Singapore from the period of 2009 to 2021

The HDI trend in the Philippines and Singapore from 2009 to 2021 was visually displayed and carefully analyzed, where the HDI experienced an overall increase in their HDI throughout the 13 years. It shows the measure of countries’ levels of social and economic development.

The result shows that the two countries encountered diverse changes in their HDI scores across a decade but there is a stable trend in the Philippines in 2015 to 2016, while Singapore experienced its stability and its highest HDI in 2019, at 0.945. However, in 2020 to 2021, the two countries encountered a decline. In the Philippines, there was a 9% decline while Singapore's HDI faced a 3% decline. Singapore have the highest HDI score of 0.945, and the Philippines reached its peak at 0.714. This indicates that Singapore has higher HDI compared to the Philippines and it can sustain its HDI without solely relying on the national education budget. According to the World Bank (2024), with the quickly growing services industry, which includes business process outsourcing, wholesale and retail trade, and tourism, the private sector is still thriving. Not until the year 2019, due to the COVID-19 pandemic, the HDI percentage of the Philippines from the year 2020 to 2021 decrease, showing its major cause.

Regression Results

The result of the regression in the Philippines demonstrated a significant relationship between government spending on education and Human Development. The value of the adjusted r-squared in the regression equation is 0.857382, which implies that the government spending on education makes up 85.7% of the HDI indicating that the HDI of the Philippines is dependent on the budget allotted for education. The null hypothesis was rejected since the p-value is less than the level of significance indicating that the government spending on education is a significant factor in HDI.

The coefficient has 0.591539 units, indicating a positive relationship between the government expenditures on education and HDI. The researchers are 99% confident in rejecting the null hypothesis. While in Singapore, the regression equation presented a negatively significant relationship between government spending on education and HDI. The value of adjusted r-squared relationship is 0.57882, indicating that the government spending on education explains 57.2% of the variation of the HDI. This denotes that the remaining 43% were attributed to other dimensions. The null hypothesis was rejected because since the p-value which is 0.0017 is less than the significant level of 0.05. This indicates that there is a significant relation between the dependent and independent variables.

The value of the t-ratio is -4.135 with a probability value of 0.0017, which is less than the significance level of 0.01. This means that government spending on education has a significant impact on HDI, and that direction is negative. The researchers are 99% confident in rejecting the null hypothesis.

Conclusions and Recommendations

Within the span of 13 years (2009 to 2021), the government spending on education in the Philippines and Singapore has fluctuated, and it can be seen that the allocation of spending have an alternating upward and downward trend. The Philippines struggled with fluctuations and a significant decline after 2017, largely due to the COVID-19 pandemic, while Singapore maintained a more stable approach to its education budget despite some shifts in priorities. These trends prove that Singapore's strategic planning and resilience allowed it to better navigate economic challenges, while the Philippines faced greater difficulties in sustaining consistent investment in education.

For the past 13 years (2009 to 2021), the Human Development Index in the Philippines and Singapore had an upward trend from 2009 to 2019, but a decline in the following year until 2021. Singapore's HDI has been higher than the Philippines throughout the 13 years. The upward trend indicates improvements in human development and the effects of various factors, such as education.

The regression results proved that the independent variable has a significant relationship with the dependent variable. The value of the coefficient in the Philippines shows that there is a positive relationship between the government spending on education and HDI. Also, the p-value is less than the significance level, indicating that the null hypothesis was rejected. While in Singapore, the value of the coefficient shows that there is a negatively significant relationship between the government spending on education and HDI. Further, the p-value is less than the level of significance, implying that the null hypothesis is rejected. Therefore, government spending on education play a significant role in HDI.

On the basis of the above findings and conclusions, the following recommendation were made: 1) Both countries experienced significant fluctuations and

decline in government spending after 2017. To address this, the government of the Philippines should aim to increase and stabilize its budget, making sure to have a consistent investment even during an economic downturns, while for Singapore with high HDI, it may sustain its budgetary expenditure for their education sector while continuously keeping their budget for other public services. This approach can help mitigate the negative impact on HDI especially in the Philippines; 2) The government in both countries specifically the Philippines is encouraged to work with international organizations and secure a long-term development plan to resolve different issues that may arise regarding the HDI and government spending on education; 3) A deeper analysis of other factors influencing the HDI may be conducted specifically on exploring how education spending translates into measurable outcomes in both countries to provide more concrete insights; and 4) Studies considering the relationship of the Human Development Index and government spending on education in various countries should be conducted to assess effective strategies for budget allocation on education and its impact on HDI in the Southeast Asia or even worldwide.

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