Education and Economic Growth:
A Case Study in Malaysia

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Abstract: This paper studies the effect of education level on economic growth in Malaysia. Specifically, the impact of primary, secondary and tertiary education on Malaysia Gross Domestic Product (GDP) is examined. Quantitative research design approach was adopted to estimate the relationship between the enrollment rates of the three different education levels on changes of GDP in Malaysia from 1984 to 2012. Results show that there is significant relationship between education levels and economic growth. Tertiary education is found to have the highest effect on Malaysia GDP. Besides, the relationship between primary and tertiary education with economic growth is found to be positive while in contrast, secondary has negative relationship with economic growth.

Keywords: education, GDP, level of study

1. Introduction

The East Asian countries have experienced rapid economic growth over the three decades which was known as The East Asian Miracle by the World Bank. Malaysia was one of the countries with growth accelerated and has transitioned from an underdeveloped state into a newly industrialized economy. The rapid economic growth was attributed to the role of human capital through formal and informal education as mentioned by Page [13].

Education has always perceived to have significant impact on the economy of a country through the development of human capital. Besides, economists also emphasize on the important role of education on the economic development through their models and theories. For instance, the Augmented Solow Growth Model by Mankiw, Romer& Weil [23] and the model by Romer [26] are the main theoretical approaches that show the relationship between human capital and economic growth through education. It is proposed that workers with higher education attainment are more skilled and productive which eventually contribute to the economic growth. The increase in the human capital will facilitate the diffusion and transmission of knowledge as well as enhance the innovation capacity and new knowledge development.

In Malaysia, government has been investing high amount of expenditure on education. The UNESCO Institute of Education Statistics shows that Malaysian’s government expenditure on education as percentage of GDP was the highest as compared to Singapore and Thailand. However, the report by Universitas 21 stated that Malaysia’s return on investment ranks only 44th out of 50 countries. The education performance also lags behind other countries with similar or lower levels of expenditure on education such as Singapore and Thailand. This indicates that Malaysia has yet to be efficient to its expenditure on education.

Besides, the past literatures have focused in examining the relationship between education level and economic growth in countries. However, there have been different results produced by different studies. Loening [12] found that primary and secondary educations are important for the economy growth. While Loening [12] also observes a significant positive relationship between tertiary education on economy growth, Adawo [18] found a negative relationship instead. Such mixed results imply that the impact of different education levels on the economic growth remain questionable.

Therefore, it perks our interest to look deeper and clarify the effect of education on economic growth in Malaysia. By looking at the effects of different education levels on economic growth, this study intends to discover the education level that has the highest impact on economic growth in Malaysia. Through this research, government will be able to be more efficient and effective on the expenditure spent on education by focusing on the education level that has the highest effect on economic growth. It helps in boosting the economic growth of Malaysia and allows Malaysia to stay competitive as well as to achieve the vision of becoming international education hub in the future.

This paper is divided into 5 sections. Section two summarizes the reviews of education system and economic growth in Malaysia. Section 3 presents the proposed model that is used to examine the relationship between education levels in economic growth. Then, section 4 will present the findings of the study and finally conclusion will be discussed in section 5.

2. Literature Review

2.1 General Impact of education

Education, being the major source of human capital investment, has significant effect towards a country’s economic growth. According to Babalola [33], there is long-run relationship between education and economic growth in Nigeria. Besides, there is also sufficient positive connection between the growth rates of GDP and the education factors in Romania which is a 12 Europe’s New Member State. The similar result of education being positive related to economic growth can also be found in Pakistan by Abdullah [2] and in Guatemala from 1951 to 2012, where better educated labor force contribute greatly to the economic growth according to Loening [12].
Despite so, there were also contradicting findings by other studies. For example, Földvári and Leeuwen [24] found an inversely U-shaped relationship between education years and economic growth, where a country’s growth starts to decrease after 7.5 years of education. In contrast, Abdullah [4] found a negative relationship between the two variables. Based on the research done by Benhabib and Spiegel [10], Pritchett [16] as well as Lau, Jamison and Louat [15], it is found that the stock of human capital (measured by mean years of schooling) is insignificant and even has negative contribution to growth in some cases. There are three reasons that explained the unfavorable impact of education on economic growth according to Pritchett [16]. Firstly, the education in developing countries is of low quality where the years of schooling have created no human capital. Secondly, the excess supply of schooling that causes an expansion in supply of educated labor surpassed demand lead to a decrease in marginal returns to education. Furthermore, the poor institutional framework also causes such negative impact to economic growth as educated workers engage in privately lucrative but socially unproductive activities.

### 2.2 Education level

There are several studies that examine the relationship of different education levels such as primary, secondary and tertiary education with economic growth. For instance, Mankiw et al. [23] together with Bils and Klenow [20] use enrollment rates as a proxy for education and the findings show significant and positive contribution of human capital towards the economic growth. Besides, Petrakis and Stamatakis [25] concluded in their study that primary and secondary education are more important for growth in less developed countries; while higher education is more important in developed countries. In contrast, Echevarria [9] found that secondary and higher education completion contribute more to the economic growth in less developed countries as compared to the developed countries.

Specifically for primary education, Self and Grabowski [32] observe a strong impact of primary education to the income growth of India from year 1966 to 1996 and the same positive impact of primary education also found in East Asia by Lau et al. [15]. Besides, studies done by Judson [30] and Barro & Sala-i-Martin [28] also acknowledge the positive impact of primary education and found no significant impact or correlation between secondary, tertiary education and economic growth. Primary education is perceived to be significant in final goods production while post-primary education is more related to innovation and technology adoption according to Papageorgiou [7] and the positive effect of initial education level on economic growth is often the phenomenon seen in countries with low productivity based on the research done by Krueger and Lindahl [3]. In contrast, the study done by Abbas [27] also show negative effects of primary education in Sri Lanka and Pakistan as well as Africa and the Middle East countries; while the insignificance of primary education is found in Latin America and South Asia according to Lau [15]. While Babatunde and Adefabi [19] observe a long run relationship between primary and tertiary education with economic growth; Adawo [18] concluded in his study that only primary education contributes to the growth; while secondary and tertiary education worsens the economic growth.

As for secondary education, Keller [14] together with Jalil and Idrees [5] concluded the significant effect of secondary education on economic growth. Besides, the human capital represented by secondary and higher schooling enrollment rate are positively related to economic growth in Pakistan and Sri Lanka according to Abbas [27]. While for tertiary education, Loening [12] discover its significant impact on economic growth but Adawo [18] found a different result of tertiary education worsening the economic growth.

Moving on, the secondary and tertiary education level is significant to the economy growth of Arab countries in the study done by Awad, Halil & Yussof [1]. Shaihani, Harish, Ismaila & Saida [21] conducted a research to study the short run and long run relationship of education levels and economic growth. The result shows that secondary education is positively related to economic growth in short run. However, only tertiary education in long run has positive relationship with economic growth while primary and secondary education has negative relationship with economic growth.

### 2.3 Education System in Malaysia

During the Malaysian independence in 1957, Malaysia was still yet to achieve political and economic stability. The government initiated monopolizing procedures for the education sector by setting up government-owned schools that lasted until mid-90s. The investment in education for human capital accumulation is crucial due to its vital role towards economic growth. There has been significant increase in the government allocation of education expenditure at all education levels along the years in Malaysia. In the mid-90s, the government policy widened up to privatize education and encouraged private sectors to invest in education. Such policy was implemented to reduce government budgets, to encourage self-regulation plans and to increase competition among business holders in order to lead Malaysia’s economy towards a fully independent nation as well as to make Malaysia an education hub of the region by 2020. As of year 2013, there are 414 private colleges, 37 private universities, 20 private university-colleges, 7 foreign branch campuses and 20 public universities in Malaysia.

Basically, Malaysian education system consists of three levels which are primary, secondary and tertiary levels. It includes 6 years of primary education, 3 year of lower secondary education, 2 years of upper secondary education, 1 to 2 years of pre-university or pre-tertiary studies and 3 to 5 years of university education. All education levels must follow the practice of national curriculum and the school calendar set by the government. According to Cole [11], the primary education and secondary education have larger effects on the basic worker productivity, while the tertiary education has larger effect on technological innovation. All education levels have been consistently leaving different sized effects on development and relating to different casual mechanisms. Thus the effects of each education level on economic growth need to be examined separately. Figure 1 below shows the education in Malaysia.
Since year 2003, primary schooling has become compulsory in Malaysia, while home schooling or home-based teaching is only allowed with permission given by the State Education Department, Ministry of Education. With such policy, the primary level enrollment rate has been nearly universal for the past decades. In 2011, Malaysia has achieved 94% of enrollment rate at the primary level. It is shown that the percentage of students who drop out from primary school had also reduced from 3% in year 1989 to 0.2% in year 2011 based on the Malaysia Education Blueprint 2013-2025. In the final year of primary school, students are required to take the “Ujian Pencapaian Sekolah Rendah” (UPSR or known as Primary School Achievement Test) and the students will then be automatically progressed to secondary school education.

In Malaysia, the enrollment of lower secondary level (Form 1-3) is not compulsory. However, the enrollment is close to universal with 98.8% gross enrollment rate and 96.4% net enrollment rate in 2014 according to Clark [22]. The ratio of the labors with secondary or higher education has also increased from 37% in 1982 to 58% in 2012. The students are required to undergo the examination of “Pentaksiran Tingkatan 3” (PT3), which was previously known as “Penilaian Menengah Rendah” (PMR) at the end of lower secondary study. The examination is compulsory in order to move on to upper secondary education and students are to be streamed into arts or science stream, technical and vocational stream or religious stream according to their results.

Form 4 and 5 are the upper secondary education where the students are streamed according to their results from the assessment in Form 3. According to Malaysia Education Blueprint 2013-2025, Malaysia has the greatest improvement in this education level where the enrollment rates had been nearly doubled, from 45% in the 1980s to 78% in 2011. In the final year of upper secondary education, students from various streams are required to take “Sijil Pelajaran Malaysia” (SPM or known as Open Certification Examination), which is conducted by the Malaysian Examination Syndicate. To be awarded with a certificate, students are required to pass the subject of national language and history. Students can then precede their studies in matriculation, Form 6 or pursue pre-university studies in private colleges or universities before taking Bachelor Degree or other programs.

### 2.3.4 Pre-Tertiary

The entry into pre-tertiary studies such as Matriculation, Form Sixth, Foundation, A-Level and Diploma will be based on the SPM results. Every student is required to undergo a range of 1 to 3 years of post-secondary studies before the degree programs. These studies are provided at national secondary schools, technical secondary school, Islamic schools, colleges and universities. Students who enter into Form 6 will be sitting for “Sijil Tinggi Pelajaran Malaysia” (STPM or Malaysian Higher School Certificate Examination) which is conducted by Malaysian Examinations Council. As for the other post-secondary studies, examinations are being conducted at the end of each semester.

### 2.3.5 Tertiary

Certificate, diploma and degree programs are categorized as the tertiary education in Malaysia. According to Vision 2020, Malaysia seeks to achieve its goal of becoming a high income nation and an international education hub by 2020. In order to achieve this goal, the education and development of quality graduates have to be intensified and net enrollment of 40% of tertiary education has to be achieved.

### 2.4 GDP Per Capita

Gross Domestic Product (GDP) is a major economic indicator as it is able to needlepoint a country’s economic health solely on its own Latham [6]. Besides, it is also considered as the barometers of other major economic variables that influence the economic growth of a country. Therefore, GDP has been commonly used as a measure of economic growth. In this study, instead of using GDP, GDP per capita expressed in current local currency is adopted as the proxy for economic growth which is the independent variable in this study.

GDP capita has been defined as the gross domestic product of a country divided by the population of the country itself. GDP per capita is more powerful than GDP as the measurement of economic growth as a national’s GDP is expected to rise with its increase in population. The result may be misleading if it simply uses GDP without taking the population into account. Thus, GDP per capita that take into account of population is the most suitable indicator for economic growth.

### 3. Methodology

This study proposes an empirical model that estimates Malaysia economic growth as a function of three different education levels, which are primary (PRI), secondary (SEC) and tertiary (TER) and is measured by enrollment rate (in percentage). The functional form of the growth model is constructed as below:
Economic Growth = f (Primary Education, Secondary Education, Tertiary Education) \hspace{1cm} (1)

\[ \ln \text{GDPPC} = f (PRI, SEC, TER) \hspace{1cm} (2) \]

As the data for the variable of GDPPC are expressed in dollar form, natural logarithm is taken to convert the data into smaller scale in order to reduce extremities in the data. While on the other hand, variables such as PRI, SEC and TER that are expressed in ratios themselves are left in levels as beta coefficients are more meaningful during interpretation. In other words, log linear functional model is used in this study.

\[ \ln \text{GDPPC} = i + a_1 PRI + a_2 SEC + a_3 TER + e_i \hspace{1cm} (3) \]

The alpha coefficients \((a)\) in this model represent the effect of each education level on economic growth. The model is constructed with the subscript \(t\) represents the year, \(i_t\) represents the intercept of model, \(a_1, a_2 \) and \(a_3\) denote the effect of primary, secondary and tertiary education on economic growth respectively and \(e_t\) denotes the unexplained variability in the estimated model.

### 3.1 Data Description

This study includes yearly data from year 1984 to 2012. The data are taken from variety sources and are summarized as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Growth (GDPPC)</td>
<td>GDP per capita (current LCU)</td>
</tr>
<tr>
<td></td>
<td>- World Bank</td>
</tr>
<tr>
<td></td>
<td>- World Bank</td>
</tr>
<tr>
<td>Education (PRI, SEC, TER)</td>
<td>School enrollment, primary (% gross)</td>
</tr>
<tr>
<td></td>
<td>- Malaysia Educational Statistics, ERPD, MOE</td>
</tr>
</tbody>
</table>

## 4. Results

Table 2 shows maximum, minimum, mean, standard deviation, skewness and kurtosis for the data of each variable. The values of maximum and minimum tell the range of the data, whereas mean shows the average value over the years. Standard deviation explains the variability while skewness and kurtosis measures the normality of the data.

<table>
<thead>
<tr>
<th>Table 2. Descriptive Statistics</th>
<th>( \ln \text{GDPPC} )</th>
<th>PRI</th>
<th>SEC</th>
<th>TER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>10.38</td>
<td>102.74</td>
<td>72.03</td>
<td>37.20</td>
</tr>
<tr>
<td>Minimum</td>
<td>8.41</td>
<td>92.69</td>
<td>52.97</td>
<td>4.74</td>
</tr>
<tr>
<td>Mean</td>
<td>9.42</td>
<td>95.97</td>
<td>61.90</td>
<td>19.85</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.63</td>
<td>2.44</td>
<td>6.27</td>
<td>11.54</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.10</td>
<td>1.14</td>
<td>0.04</td>
<td>0.09</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-1.24</td>
<td>1.29</td>
<td>-1.69</td>
<td>-1.63</td>
</tr>
</tbody>
</table>

According to Table 2, average GDP per capita in Malaysia was 9.42%. The 1986 recession had resulted in the poorest economic growth in Malaysia with performance of only 8.41%, whereas the year of 2012 showed the best economic performance. After applying the natural logarithm, we can see low variability in the data of GDP per capita evidenced by small standard deviation.

On the other hand, the average enrollment rates of primary, secondary and tertiary education were 96.97%, 61.90% and 19.85% respectively. It is not surprising that the enrollment rate of primary education was the highest since the primary education was announced as compulsory officially in 2003.

Despite secondary education has not been made compulsory until today, it is believed that free education for both primary and secondary education levels given by government is one of the reasons that have encouraged more than half of the relevant population to enroll in secondary education. Besides, tertiary enrollment rate show considerable volatility evidenced by the highest value of standard deviation. However, it implies that there are increasing number of people enrolled in tertiary education with evidence of the 4.47% as the minimum in 1984 to 37.20% as the maximum in 2012.

Moreover, Table 1 also shows that the skewness and kurtosis of each variable were ranged between ±2.0. While Gonyea et al. [29] claimed that the range for the skewness and kurtosis value to be accepted as normally distributed fall between ±1.0, George and Mallery [8] argued that the values between ±2.0 are also acceptable depending on the application of the researchers.

Table 3 presents the results of the effect of the education levels on economic growth.

<table>
<thead>
<tr>
<th>Table 3. Estimated Model</th>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Education</td>
<td>0.0367</td>
<td>0.0107</td>
<td>3.4142</td>
<td>(0.0022)*****</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>-0.0426</td>
<td>0.0095</td>
<td>-4.4876</td>
<td>(0.0001)*****</td>
</tr>
<tr>
<td>Tertiary Education</td>
<td>0.0707</td>
<td>0.0049</td>
<td>14.2844</td>
<td>(0.0000)*****</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.9653, \text{F-statistics} = 232.0017 \]

Note: *, ** and *** denote statistical significance at 0.10, 0.05 and 0.01 level respectively.

Based on the results, primary, secondary and tertiary education are significant to the economic growth at \( \alpha = 1\% \). As the coefficient of primary education is 0.0367, which shows its positive relationship with economic growth, it indicates that for each one percentage point increase in primary enrolment rate, economic growth on average will increase by 3.67%, holding other variables constant. The result is similar to the study done by Lau et al. [15] and Judson [30] where primary schooling has positive and significant impact towards economic growth.

On the other hand, the coefficient of secondary education is -0.0426, indicating a negative relationship with the economic growth. Thus, the economic growth on average
will decrease by 4.24% when there is a 1% point increase in secondary enrolment rate. Matsushita, Siddique and Giles [31] also acquire similar result in their research and explained that secondary school enrolment will delay the students’ entrance to the labour market which may contribute to the economic growth.

According to the descriptive statistic of the research, the mean of the secondary education gives a value of 61.90%, showing more than half of the relevant population is enrolled in secondary schools. This indicates that many students have delayed entering into the labour market due to their education. However, the secondary enrolment only dampen the growth of economy in short and medium term as they will eventually benefit the economic growth in the long term as the quality of labour is improved where more skills are acquired to increase the productivity and to help boost the economy, as stated by Matsushita et al. [31].

On the other hand, the tertiary education is positively related to the economic growth as the results show a value of 0.0707 for its coefficient. When tertiary education goes up by one percentage point, the level of economic growth, on average will go up by 7.07%, holding other variables constant. The result is supported by Loening [12] where tertiary is significant to the growth of economy.

Overall, the comparison of the coefficients of the education levels concludes that the effect of tertiary education is the highest, followed by secondary and primary education. Additionally, the result shows that the overall model is a good model as its R² gives a value of 0.9653. Theoretically, the higher the R², the better the model fits with the data. This indicates that 96.53% of the variation of GDP per capita is being explained by the variation of primary, secondary and tertiary education. In addition, the p-value of the overall model is 0.0000 which explains the significance of overall model at α=0.01.

5. Discussion and Conclusion

By referring to the results, all education levels are significant to the economic growth and the effect of tertiary education is the highest among the education levels. Primary education show a positive relationship with economic growth, whereby the result has fulfilled our expectations and evidenced in the study of Mankiw et al. [23] in which schooling in primary level has given a positive impact to the economic growth. In contrast, the secondary education shows a negative relationship with economic growth. The computed result is in opposition to the studies done by previous researchers such as Judson [30], Barro and Sala-i-Martin [28], Adawo [18] as well as Shaibani et al. [21]. This could be happened due to the latency period of students entering into workforce.

However, it is suggested that the rising in secondary enrollment may result in higher continuation of students in pursuing pre-tertiary education, which believed to provide greater positive influences on economic growth in the long run as stated by Matsushita et al [31]. This is evidenced by the greater positive effects of tertiary education on economic growth found in this study, which has also achieved the initial expectation on the importance of tertiary education in boosting the economy based on Loening [12]. As a result, it is believed that the net outcome of the contrary influence between secondary and tertiary education would be positive and large on economic growth.

Lastly, the tertiary education show significant positive relationship to the economic growth. As the number of international students enrolling in tertiary education in Malaysia has increased over the years, it has directly boosted the economy through the expenditure of foreign students in our country. This can be proven by Verbik and Lasanowski [17], where 55000 or 2% of total foreign students in the world enrolled in Malaysia.

References


