Relationship between Education Expenditure, Capital, Labor Force and Economic Growth in Malaysia

Norimah Rambeli @ Binti Ramli[1], Emilda Hashim[2], Dayang Affizah Awang Marikan[3]

[1,2,3,4]Faculty of Management & Economics, Sultan Idris Education University, Tanjung Malim, Perak Darul Ridzuan 35900, Malaysia
(Correspondence: norimah@fpe.upsi.edu.my)

ABSTRACT

Educational institutions play important role in producing highly educated communities. Investment in education an opportunities expansion to obtain higher education has become main economic development agenda in many countries, including Malaysia. Therefore, this study is conducted to examine the relationship between government expenditure and economic growth from 1970 to 2013. By using Cobb-Douglas Production Function in developing Multiple Regression Linear Model, the results show a significant and positive relationship between education expenditure and Malaysian economic growth. The findings further suggest that capital and labor force also influence economic growth in the long run.
Keywords: Education, Government Expenditure, Economic Growth

INTRODUCTION

Human capital plays a vital role in generating economic growth of a country especially at higher education level. Now, in line with the rapid technology advancement and increase competition has brought in major changes in the labor market. This situation has led to an increase in demand for employment. Currently, contemporary economy requires people with higher education to meet knowledgeable and skilled manpower.

Education and development are keys to improve the country's competitiveness. The education system must be able to meet the needs of commercial and industry, as well as producing innovative, productive and skilled workforce. Labor is also an important input in economic development and growth of a country. The formation of human capital through education and training will contribute to economic growth of a nation. According to Lucas (1993), education and training are agent of growth in producing human capital with knowledge and skills (quoted from Grillches, 1996).

The development of labor force is an ongoing process to improve the quality of human capital. This is in line with the government's agenda in the Malaysian Education Blueprint (2013-2025). Goals and approaches used by the Ministry of Education in producing national education system is based on five main aspirations characteristic of access, quality, equity, unity and efficiency. In drafting this plan, there are nine priority areas identified from the National Education Assessment Report which have been scrutinized. The first scope is related to uphold the dignity of the teaching profession, the second is to improve the quality of school

leadership, the third, is to upgrade the quality of schools, the fourth is to strengthen the quality of curriculum and assessment, the fifth is to ameliorate the mastery of multiple languages, the sixth is to fortify parental involvement in the private sector and society as partners in education, the seventh is to bolster students' readiness to seize opportunities in higher education and the labor market, the eighth is to enhance the efficiency and effectiveness of resource management and lastly is to build the capacity and the ability of the education system.

The quality of our human capital is the most important element in achieving the National Mission. This is congruous with the development of human capital, which is the main thrust of the Ninth Malaysia Plan (9MP). Labor force development, also known as human capital (human capital), is a government agenda that has been emphasized under the 9th Malaysia Plan. The Plan outlines the human capital strategy so as to put our society to be at the level of first-class mindset. Therefore, the education agenda under the 9MP is to form a well-developed community and country in several aspects, namely advanced economics, balanced social development and foresighted and open-minded society.

In addition, Malaysian government emphasizes on primary and secondary school education to meliorate access to quality education in rural areas, particularly in Sabah and Sarawak. Hence, the government accentuate on providing to provide a solid foundation on Mathematics, Science and English as well as cultivating good ethics and discipline among students. Besides, the government seeks to ensure that all students will acquire education at all level, thereby eliminating school dropouts.

Furthermore, special education programs are being introduced by the government to provide opportunities for children with special needs, while ordinary schools are equipped with special classes and facilities to meet the needs of these disabled children. This special class provision intends to ascertain that children with special needs can adapt to normal school environment. In fact, the government plans to improve the quality of teaching and learning whereby more teachers will be trained and special education curriculum programs will be improved in order to ensure the success of this program.

Next, tertiary education opportunities were provided to achieve the target of 40 percent participation rate in tertiary education for 17 to 23 age groups in 2010. Thus, enrolment in tertiary level increased to accomplish 25 per cent target of the total enrollment at undergraduate level in 2010. Special programs have been implemented to increase student's enrollment at tertiary level, especially in programs that are related to science and technology. Other than that, more courses at Diploma level will be offered by the government to meet the demand for technicians and associate professionals, which are expected to increase.

Currently, Malaysia is close to reaching year 2020, in which Vision 2020 is visualized to transform Malaysia into a developed and competitive nation in its own terms. Accordingly, its main agenda is to develop a world-class education system. Thus, the Ministry of Education has great responsibility in developing progressive, ethical and highly skilled human capital. Malaysia now has excellent infrastructure facilities to be proud of. On that account, the country needs to focus on human capital development in producing highly educated, ethical, innovative and

skillful labor force in order to remain competitive. This will eventually lead to steady economic growth.

Various factors need to be considered in developing human capital in Malaysia, primarily in government spending in education and training. Aside from that, labor force is another element that must be accentuated in human capital development. Labor force is a crucial determinant in the development of human capital to ensure the success of creating better quality of human capital. The government's intention to produce human capital, thereby, will be accomplished should the labor force is given sufficient training and proficient in performing the work.

However, the question arises whether the development of human capital through government spending in education and training is essential in contributing to Malaysian economic growth or not. Should the country wants to reach advanced economy, what is the importance of labor force to increase the country's human capital, and at the same time, strengthen the country's economic structure.

Therefore, a detailed study should be undertaken so see more clearly the effectiveness of human capital development and its impact to the country. Does government expenditure is truly capable to boost economic growth? To what extent, government spending can influence the development of human capital and can affect economic growth? Should education expenditure and increased labor force are vital to human capital development, these two factors should remain to be the main agenda of the government in its effort to boost the country's economic growth, the positive growth toward positive spending should be continued.

LITERATURE REVIEW

Government spending in the education sector is divided into two, namely operating expenditure and development expenditure. Operating expenditure is expenses incurred to finance the daily activities that are recurrent and continuous. Examples of operating expenditure are the payment of salaries, allowances, payment of utility and other services. Development expenditure refers to capital expenditure that are not repeated and always expected to give returns in the long run. Thus, it involves a large capital or provision, giving long-term benefits and requires supervision and maintenance. Development expenditure is intended to provide the infrastructure and facilities in schools and institutions of higher education. Therefore, development expenditure is separated from operating expenditure as it requires a careful planning and is complicated. Development expenditure includes capital expenditure projects that will improve the socio-economic level, besides promoting economic growth.

Rahmah (1998) studies the contribution of education to economic growth. She uses the data of capital, labor, literacy, education spending and exports throughout 1970-1996. There are two education variables used in the analysis that are, the literacy rate and government spending on education. Both factors are included in the production function together with basic factors of production such as capital and labor, which is estimated through regression models

using "ordinary least squares (OLS)". The study finds that there is a significant relationship between education (literacy rate and education expenditure) and the country's economic growth, although exports contributed the most.

Next, McMahon (1998) conducts a survey concerning comparative study in East Asian countries. He reveals that labor force development through education spending at secondary and tertiary levels is very important to economic growth. Accordingly, Permani (2009) in his study on the strategy of development in the East Asia region, discovers that the region give high emphasis on education. His findings show that there is a positive relationship between education and economic growth in the Asian region. At the same time, there exists a 'two-way' causal relationship between education and economic growth.

According to Meulemesteester & Rochat (1995), advocate that education is one of the factors that has a positive impact on economic growth of a country. They also stress out that education indicators affect economic growth. Moreover, highly educated human capital factor is complementary to other factors such as capital, labor force and exports in the economic development process.

Meanwhile, Asteriona & Agiomirgianakis (2001) conduct a study on the relationship between higher education enrollment toward Greece economy from 1960 to 1994. The results indicate that one percent increase in higher education enrollment has increased the country's output by 0.42 percent. On the other hand, Self and Grabowski (2004) examine income growth in India from 1966 to 1996 by dividing the level of education into three: primary, secondary and tertiary level. Their study demonstrates primary education plays highest role in the national income growth.

Apart from that, Hasnah et al. (2009) analyze the importance of education sector in Malaysia's economic development plan. The empirical study is done to determine the effectiveness of education spending toward Gross Domestic Product (GDP) growth. The study delineates that education and human resources development have always been emphasized in every five-year development plan starting from the First Malaysia Plan (1MP) up to the latest Malaysia Plan. Human capital development policy, chiefly in education and training sectors, has become increasingly important, especially after Malaysia's economic transition from labor-intensive to capital-intensive and technology.

Furthermore, a study done by Pradhan (2009) supports and proves that education has a very high economic value and should be considered as the country's capital. He also suggests that the capital must be invested in the country, India for the development of human capital and physical capital will contribute to India's economic growth. Afzal, M. et. al. (2010) also recognize that education has a positive relationship with economic growth in Pakistan in both period, short run and long run.

Later, Siti Norihan et al. (2013) do a study on the relationship between higher education and GDP and identify the contribution of education institutions to the development and growth in

Malaysia. They want to analyze the extent of higher education, a major component of labor force, contributes to economic growth in Malaysia, from 1991 until 2011. In their study, parameter estimation is done through the method of least squares (OLS) to obtain the value of input elasticity as a basis to measure the contribution of higher education and other inputs toward economic growth. The empirical evidence from OLS analysis carried out by them in the study support the existence of a positive relationship between the variables of higher education and economic growth in Malaysia.

Moreover, Hasnah et. al. (2009) scrutinize the importance of education in development planning and at the same time, determine the impact of the effectiveness of education spending to the GDP growth. Their analysis depict that the variable has a positive relationship with the dependent variable as indicated by the GDP as well as capital and labor.

According to Lin (2003) in his study on the impact of education and technical progress on economic growth in Taiwan for the period in 1965 until 2000. He illustrates that education has a positive and significant relationship with economic growth. However, the study denotes that the contribution of technical progress is found not so important.

Further studies done by Kakar. Z. K., Khilji. B. A & Khan. M. J (2011) in Pakistan discover that there is no significant relationship between education and economic growth in the short run. Nonetheless, the development of education have had an impact on economic growth in the long term. These findings also show that government spending in the education sector is not only has a positive impact on economic growth in the short term but also the long term.

In their study on "Education Expenditure and Economic Growth: A Causal Analysis for Malaysia", Mohd Yahya, Fidlizan, Mohd Fauzi & Azila (2012) point out that education has a long-term relationship with economic growth whereby education quality is needed to boost economic growth and human capital abilities. They also elaborate on other indicators, namely (CAP) and (LAB) as having a positive relationship in the long term with Malaysia economic growth. Based on the results of their study, they recommend that the government should increase education expenditure to stimulate the growth of national economy.

METHODOLOGY

Based on theoretical and literature review, the sign and size of the required parameters can be determined. Due to unit differences between variables, data has been converted to a linear form LN for estimation purposes. Another reason for conversion is to avoid problems in the model specification. Below is ln linear model of economic growth that has been formed in Multiple Regression Model, in which the method of Ordinary Least Square (OLS) can be used, namely;

$$KDNKt = \alpha\, lnEDU_t{}^{\beta 1}\; lnCAP_t{}^{\beta 2}\; lnLAB_t{}^{\beta 3}\; e^{\mu t} \qquad\qquad (Equation\ 1)$$

Where,

T $\qquad$ = trend from 1970 until 2013
A $\qquad$ = intercept
$\beta_1, \beta_2, \& \beta_3$ $\qquad$ = parameter of the variables to be estimated
μ_t $\qquad$ = random error value

One application of multiple log-linear model is a model of Cobb-Douglas production function that regress output, the dependent variable (Y), on labor input (X_1), the first independent variable, and capital input (X_2), the second independent variable. Cobb-Douglas production function belongs to the group of non-linear regression model or a multiple log-linear. Specifications and discussions that are related to the Cobb-Douglas production function and specification of this model are as follows;

$$Y_i = A_1 \, X_{2i}{}^{\beta_2} \, X_{3i}{}^{\beta_3} \, e^{\mu_i} \qquad\qquad\qquad \textit{(Equation 2)}$$

Where:
Y_i = Output
X_{2i} = Labor Input
X_{3i} = Capital Input
μ_i = stochastic error terms
e = Base of natural logarithm

If the model in equation 2 is converted to ln-linear form, then, the following equation is obtained;

$$ln \, Y_i = lnA_1 + \beta_2 lnX_{2i} + \beta_3 lnX_{3i} + \mu_i \qquad\qquad \textit{(Equation 3)}$$

Interpretation of the parameters in the Cobb-Douglas model are as follows;

1. β_2 is a partial elasticity (partial elasticity) output contributed by labor input. This parameter measures the percentage change in output caused by the percentage change in labor input with other input assumptions, the capital does not changed. For example, if labor increases by 10% while capital input is fixed, output will increase by (10 times β_2%).
2. β_3 is a partial elasticity (partial elasticity) output contributed by capital input. This parameter measures the percentage change in output caused by the percentage change in capital input with other input assumptions, that labor does not changed. For example, if capital increases by 10% while labor input is fixed, output will increase by β_3%.
3. The amount of β_2 and β_3 ($\beta_2 + \beta_3$) will provide information related to returns of scale in the Cobb-Douglas production function. For example, if all inputs, namely labor and capital, respectively, increase by two-fold and available output also increases by two times, the condition is known as constant returns of scale (constant returns to scale). If all inputs, namely labor and their capital increased by two times and found the output will increase by more than double, this condition is known as increasing returns of scale (increasing returns to scale). Conversely, if all the labor and capital inputs, respectively, increased by two-fold and available

output only increased by less than two times, the condition is known as diminishing returns of scale (decreasing returns to scale).

RESULTS ANALYSIS

Through the application Eviews 9.0, the test result forms the first model of economic growth output, for 1970 until 2013, as follows:

$$KDNK_{Pt} = 2.842 + 0.908EDU_t + 0.078CAP_t + 0.001LAB_t + \varepsilon_t \qquad \text{(Equation 4)}$$

Where,

se	=	(0.130)	(0.027)**	(0.029)**	(0.001)*
t	=	(21.860)	(33.651)	(2.679)	(0.629)
R^2	=	0.985	$\overline{R^2} = 0$		
F	=	853.434			
DW	=	1.049			

Note: Figures in brackets in the first line is the standard error (standard error) while figures in the second row are the values of the t-test.

** Significant at a confidence level of 99%
* Significant at the 40% confidence level

Results of the analysis suggest that all independent variables are important in explaining the country's economic growth at a 99% confidence level except labor force variable (LAB). It means that the independent variables, EDU_t, and CAP_t, are important in influencing economic growth (GDP). However, independent variable, LAB_t, affects economic growth (GDP) at 40% confidence level.

Summary of the equation 4 is as follows:

i.   The values of the estimator in equation (4) is β_0 = 2.842, β_1 =0.908, β_2 = 0.078 dan β_3 = 0.001.
ii.   Values of t-statistics of the estimator for independent variable coefficients, that are, β_2= 33.651, β_3= 2.679, β_4 = 0.629
iii.   Nilai R^2 = 0.985. This means 98 percent of the variation in $KDNK_{Pt}$ is described by EDU_t, CAP_t, dan LAB_t . While another two percent cannot be explained by the EDU_t, CAP_t, dan LAB_t due to the residual (error in the sample). This means that two percent of the sample variance is explained by other variables not included in the estimation model.

From the model, it is found that in the event of a 1% increase in education spending on education and training (EDU_t), then the value of the Gross Domestic Product (GDP) will increase by 0.908%. In the event of a 1% increase in capital (CAP_t), then, the value of the Gross Domestic Product (GDP) will increase by 0.078 percent. Meanhile, in the event of an increase of one percent of labor force (LAB_t), the production value of economic growth will increase by 0.001

percent. This indicates that the variables EDU_t , CAP_t dan LAB_t have positive relationship with economic growth (GDP), in which changes in all three of these variables will have a positive impact on GDP.

R^2 values obtained are equal to 0.984, namely 98% variation in the value of economic growth can be described or explained by the independent variables EDU_t, CAP_t, dan LAB_t. From this study, it is found that the two variables are significant at the 99% level of DUT and Capt. This means that the independent variables, EDU_t dan CAP_t. are important in describing the dependent variables included in the model.

CONCLUSIONS

Through the adoption of the multiple linear regression method, the findings obtained in this study show that the government spending on education is among the dominant factor that influence the economic growth. This means, the analysis supports that the variable of government spending on education variable is the most important and positive factor in driving the country's economic growth in the long run. The result analysis further advocates capital and labor force as factors that affect economic growth of a country. The effects shown by both of these variables on economic growth are positive in the long run, as well.

In a nutshell, the government should not ignore the role played by education expenditure, capital and labor force because neglect of these variables could give inauspicious effect to the national economy. For example, with increased spending on education each year, the government will be able to increase its economic growth in the long run. This will be the thrust for the country to become a developed nation by 2020.

REFERENCES

Aini Jaafar (2006). "Islam Dan Modal Insan." Yayasan Dakwah Islamiah.

Afzal, M., Farook, M.S., Ahamad, H.K., Begum, I. & Quddus, M.A. (2010). "Relationship between School Education and Economic Growth in Pakistan : ARDL Bounds Testing Approach to Contegration", *Pakistan Economic and Review* 48(1). 39-60.

Asteriou, D. and Agiomirgianakis, G.M. (2001). Human Capital and Economic Growth Time Series Evidence from Greece. *Journal of Policy Modeling* 23: 481–489

Aziah, Yaakob dan Yahya. (2006). "*Kepimpinan dan Pembangunan Pelajar Sekolah di Malaysia*". Batu Caves Selangor. PTS Professional Publishing Sdn. Bhd. http://www.yadim.com.my/Sosial/SosialFull.asp?SosiallD=320

Becker, Gary S. (1994). Human Capital : *A Theoretical and Empirical Analysis with Special Reference to Education*. Chicago : The University of Chicago Press.

Chang, Tsangyao, Fang, Wenshwo, & Wen, Li-Fang. (2001). *Energy Consumption, Employment, Output, and Temporal Causality* : evidence from Taiwan based on co-integration and error correction modelling technique. Applied Economics 33: 1045-1056.

Lin, T.C. (2003). Education, Technical Progress, and Economic Growth: The Case of Taiwan. *Economics of Education Review* 22: 213–220.

Chun-Lin, Tin (2004). The Role of Higher Education In Economics Development: An Empirical Study of Taiwan case. *Journal of Asian Economics* 15: 335-371.

Denison, Edward F. (1985). *Trends in American Economics Growth* : 1929-82. Washington D.C : The Brookings Institude.

Gujarat Damador N. (2004). Basic Econometric, 4th Edition The McGraw-Hill Companies

Griliches, Zvi. (1996). *Educational Human Capital and Growth* : A Person Perspective. National Bureau of Economic Research (NBER). Working Paper 5426.

Hasnah Ali., et. al. (2009).   Keperluan, Kepentingan dan Sumbangan Perancangan Pendidikan dalam Pembangunan Ekonomi Malaysia. *Jurnal e-Bangi* 4(1). 13-29.

Kakar. Z. K., Khilji. B. A & Khan. M. J (2011).   "Relationship Between Education And Economic Growth in Pakistan : A Time Series Analysis". *Journal of International Academic Research* 11 (1). 27-32.

Kraft, J,. & Kraft, A. (1978). On the relationship between energy and GDP. *Journal of   Energy and Development* 3:401-3

Lau, Lawrence J, Jamison Dean T, Liu Shu-Cheng & Rivkin, Steven. (1993). Education and Economic Growth : Some Cross sectional Evidence from Brazil. *Journal of Development Economics* 41:45-70.

Lucas, R.E., Jr. (1993). Making a micracle Econometrica 61, hlmn 251-272.

Madihah Mohd Yusuf. (2008), Modal Insan Pemangkin Negara Maju. http://cempakabiru.wordpress.com/2008/02/25/modal-insan-pemangkin-negara-   maju/ 25 Februari 2008.

Maulemeester, Jean-Luc De & Rochat, Dennis. (1995). A causality analysis of the link between higher and economic development. *Economic of Education Review* 14(4): 351-361

McMahon, R. G. P. (1998). Stage models of SME growth reconsidered: Small Enterprise Research: The Journal of SEAANZ, 6 (1998).

Muhammad Azeem Qureshi, (2009). Human Development, Public Expenditure And economic growth: a system dynamics approach. *International Journal of Social Economics* 36(1): 93-104

Muhammad Hisyam Mohamad (2005). "Islam Hadhari Bentuk Modal Insan Berkualiti." Institut Kefahaman Islam Malaysia. http://www.ikim.gov.my/v5/index.php

Mohd Yahya Mohd Hussin, Fidlizan Muhammad, Mohd Fauzi Abu @ Hussin & Azila Abdul Razak (2012). Educational Expenditure and Economic Growth: A Causal Analysis for Malaysia. *Journal of Economics and Substainable Development*. 3: 71-88

Noor Hasmahani Mohamad Hanipah, Pooh Bee Tin, Noorasiah Sulaiman (2012). *Guna Tenaga dan Produktiviti Buruh dalam Sektor Pembuatan di Malaysia*. Prosiding PERKEM VII, Jilid 2 (2012) 942-958.

Permani. R. (2009)."The Role of Education in Economic Growth in East Asia: A Survey,Asian Pacific. Economic Literature 23(1). 1-20

Petrakis, P.E & Stamatakis, D. (2002). Growth And Educational Levels: A Comparative Studies. Economic of Educational Review 21: 513-521

Psachararopoulos.G. (1995). Return to Education: A Further International Update and Implication. *Journal of Human Resources*. Vol 20 No4. PP 583-604

PIPP (2006-2010). "Pelan Induk Pembangunan Pendidikan 2006-2010" h.12 PIPP (2006-2010), " Pelan Induk Pembangunan Pendidikan 2006-2010". Edisi Pelancaran, h-3-4

Rahmah Ismail. (1998). Sumbangan Pendidikan Kepada Pertumbuhan Ekonomi Malaysia, 1970-1996. *Journal Ekonomi Malaysia* 32:3-20

Rahmah Ismail. (2009). The Impact of Human Capital Attainment on Output and Labor Productivity of Malay Firms. *The Journal of International Management Studies*   4(1): 221-230.

Schultz, T.W. (1961). Investment in human capital. American Economic Review. 51: 1-17.Self, Sharmita & Grabowski, Richard, 2003. Education and long run development in japan. *Journal of Asian Economics (14)* ; 565-580.

Self, S., & Grabowski, R. (2004). Does Educational At All Levels Cause Growth : The Case of Taiwan. Economic of Education Review 22 : 213-220.

Siti Norihan Abd Razak & Hasnah Ali (2013). *Sumbangan dan Kepentingan Pendidikan Tertiari dalam Pertumbuhan Ekonomi Negara* : Satu Kajian Kes Di Malaysia. Prosiding PERKEM VIII, Jilid 2 (2013) 806-816.