EDUCATION, ENTREPRENEURSHIP AND ECONOMIC GROWTH: EVIDENCE FROM MALAYSIA.

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ABSTRACT

Economists have long stressed the importance of human capital to the process of growth. Low human capital investment and poor schooling outcomes lead households into poverty trap. Previous research saying that entrepreneurship is able to raise the economy and alleviate the poverty level. In order to achieve the targeted economy level, which is to be a full industrial country; the future of a country depends on the quality of entrepreneurs. Developing countries are aware of this issue and therefore, they improve their policy to strengthen their education systems by providing human capital stock by which directly or indirectly produce educated entrepreneurs. Against the background the purpose of this paper is to explore the issues related to education, entrepreneurship and economic growth in the context of Malaysia. This research capitalises the Solow model augmented human capital in an effort to explain variations in growth levels. Measurement of human capital stock between year 1980 and 2007 has been constructed and employed in growth accounting exercises. This paper gives special attention to the total of enrolment at primary, secondary and tertiary level of education and its affect to economic growth. In addition logistic and linear regressions are used to analyze the correlation between educations and economic growth. The results of this study shows that education is positively and significantly impact the economic growth. The result of the study is instructive, A high priority should be given to human capital accumulation and productivity growth, if Malaysia to sustain its growth and welfare improvement in the next decade.

Keywords: Education, Human Capital, Total of School Enrolment, Entrepreneurship, Economic Growth

INTRODUCTION

It goes without saying that the rich and developed nations today are developed-minded. On the contrary, the less developed countries which have been poor and stagnant for centuries are in a state of revolt against poverty, disease, ignorance, and dominance by stronger to the forces of the market, the whim of nature, or judgment of colonial rulers. The one and only panacea to address a gap between the developed and less developed countries is through education. Education is emphasized as a key element in the process of development. Educationôs claim to play a unique role in growth and development, be it in the life of the nation or of the individual is increasingly being put to the test: it now tend to be view as the master determinant of all aspects of change and it is in the developing countries of the world that education is viewed with the greatest hopes (Gopinathan, 1974). Recent discussions on how to reduce poverty in less developed countries also emphasize the role of education (World Bank, 2007). The contribution of manpower to China and India in this 21st Century has opened the world eyes of the important of education and labor skills.

Economists have been long been aware of the importance of human resource development. Adam Smith, for example, stressed the importance of education at various points in the *Wealth of Nations* and Alfred Marshal emphasized the importance of education as a national investment and in his view the most valuable capital is that invested in human beings (Huq, 1975). In the development of the concept of capital formation by investment in education, Schultz (1971) has indicated that the part of measured growth in advanced countries that cannot be accounted for by increasing labor and capital, as conventional measured, can be explained by human capital or the quality of labor input, representing the productivity of investment in education and in training the labor force. Human resource development is the process of increasing knowledge, skills, and capacities of all people in the society. In economic term, it could be describes as the accumulation of human capital and effective investment in the development of an economy (Harbison, 1964).

In relation to this, human resources developed in many ways. First (the most obvious) is by formal education, beginning with primary or first-level of education, continuing with various forms of secondary education, and then higher education including the colleges, universities, and higher technical institutes. Second, human resources are also developed on the job through systematic or formal training programs in employing institutions: in adult education program, and through systematic or informal training programs in employing institution; in adult education programs; and through membership in various political, social, religious and cultural group (Harbison, 1964).

Developing countries like Malaysia need to improve productivities by improving the human capital in order to sustain in global markets and remain stable in the economy (Ng, 2002) and it should learn from its nearest neighbor - Singapore. Unlike Malaysia in which rich with various natural resources, Singapore have no natural resources, but the country have achieved amongst the highest GDP per capita in the world. Malaysia is lagging behind compared to Singapore. One of the main reasons why Singapore is so successful because she has invested heavily in education. At present the country has the highest percentage of literacy in the world. Realizing education is a prerequisite to economic growth, other countries especially developing countries could not help but to learn from Singapore. As mentioned by the former prime minister of Malaysia, Tun Dr. Mahathir Mohamad, *developing countries must continue to enhance their domestic resilience and capacity. Thus, they must continue to invest in human resource development, education and strengthening of domestic institutions and laws to enable them to face the challenges of globalization* (Ng.2002).

Against the above mentioned background the main purpose of this study is to analyze the effect of education on economic growth in Malaysia. Therefore, the main questions for this research are:

1) Is there any correlation between education and economy growth in Malaysia?

2) Is level of education determines the economic growth in Malaysia?

The main objective of this study is to assess the impact of education on economy growth in Malaysia between 1980 and 2007. The specific objectives of this study are as follows:

1) To examine the impact of education on the economic growth in Malaysia.

2) To determine the relationship between level of education and economic growth in Malaysia.

LITERATURE REVIEW

Economy Growth

Theories of world growth attempt to explain the continuous growth in income per capita in the world economy over the last two hundred years (Klenow and Rodriguez-Clare, 1997). Most of the best-known models of endogenous growth e.g. Lucas (1988); Romer, (1990a); Grossman and Helpman, (1991)) belong to this group of theoretical model which are supported by more in depth empirical growth studies (Mankiw et. al. (1992); Barro and Sala-i Martin, (1995). However, the Solow growth model (1956) is one starting point for modern economic growth theory that claims the economies with the same structure will have the same steady-state of output, a constant output in per capita term that determines an economyôs central tendency (Li, 2005). Based on the neoclassical production function, this model defines output (Y) as a function of total exogenous technological progress (A), physical capital (K) and labor (L).

$$Y = ä (A, K, L) \qquad (2.1)$$

Previous study has used real GDP (Growth Domestic Product) per capita as indicator of output (Y) or economy growth. According to Psacharopoulos (1984), the dependent variable in growth accounting exercises has typically been changes in the measure level of income either GNP (Growth National Product) or GDP. Instead of GDP, Total Factor of Production (TFP) growth has been measured as output to see economy growth in certain countries. Meanwhile, to determined economic growth previous researchers such as Mankiw et al. (1992), Romer (1990b) and Topel (1999) used Solow variable which is technology, capital and labor as independent variable.

Technology

The Solowôs growth model views technological progress, which determined by exogenous factors, as the key driving force for economic growth. Romer (1990b) argues that technology in this model does not correspond to anything in the world and it is possible to understand capital in terms of things like machine tools that can be observed. Moreover, he argues that for technical reasons, the Neoclassical Market Theory mapped this split onto the theoretical dichotomy between public and private goods. The theory only relates to things that live in models shifting production possibility frontier and the like. According to Li (2005), the growth rate of output depend on technological progress but in the short run, the growth rate of output is affected by saving rate and population growth along with the technological progress. In this model, high rates of growth occur when a country finds itself way below its steady-state path and alternative theory of this type view high growth as technological catch up and low growth as technological falling behind (Klenow and Rodriguez-Clare, 1997).

In a further study Bartel and Lichtenberg (1987, 1991) used pooled cross-sectional industry-level data, demonstrating that industries with relatively young or immature technologies pay higher wages to worker of a given age and education than do industries with mature technologies. A one-standard-deviation decreases in the mean age of an industry's equipment leads to a 3-percent increase in wages within each demographic group. This evidence is consistent with the hypothesis that the reward to ability is higher in new technologies. Clearly, alternative theories will be consistent with this evidence as well. In addition, the evolution of the wage structure in the United States during the twentieth century, as documented by Goldin and Margo (1992) and Katz and Murphy (1992), is largely consistent with the above observation. These studies found that the wage differential between skilled and unskilled labor widened until the 1930's, narrowed during the fourth, fifth, and sixth decades of the twentieth century, and has been widening again in the past two decades. One may identify the source of these two waves of widening inequality with major technological advances: the first wave may be associated with the increase in the industrial use of network electricity, while the second wave may be attributed to the soaring use of electronics (Krueger, 2003). Gallor and Tsiddon (1997) explored a novel technological link in the relationship between inequality and economic growth by distinguishing between the effect of technological progress on the returns to ability, training, and specific human capital. Gallor and Tsiddonôs paper may provide a theoretical resolution for the puzzle regarding the divergence in the evolution of within-group inequality and between-group inequality. Some evidence in supporting this hypothesis is provided by the literature (e.g., Frank R. and Cook P., 1995) on the market for superstars who suggest that the life cycle of technology may govern this cyclical pattern as well.

Capital

Overall, the evidence on the return to capital appears consistent with the Solow model and directs measurement of the profit rate, suggesting there is large international variation in the return on investment/capital (Mankiw et. al., 1992). The strong relationship between fixed capital formation shares of GDP and growth rates since the World War II has led many writers, such as De Long and Summers (1991, 1992), to conclude that the rate of capital formation or of capital formation in the form of equipment, determines the rate of a country's economic growth. An earlier study by Lipsey and Kravis (1987) found that for five year periods within the longer spans, the rate of growth was more closely related to capital formation rates in succeeding periods than to contemporary or preceding rates and that result suggested that the observed long-term relationships were due more to the effect of growth on capital formation than to the effect of capital formation on growth. Blomström et. al. (1996) had conducted the research to determine direction of influence and their timing between capital formation ratios and rates growth. The results of their study show that per capita GDP growth in a period is more closely related to subsequent capital formation than to current or past capital formation.

Previous researchers had conducted the physical capital form with different method. Wang and Yoa (2003) estimated the real capital stock for the aggregate economy suing the standard perpetual inventory approach and the investment series was used as gross fixed capital formation at current prices, which was based on the total social fixed asset investment. In particular, the investment deflator used by Hu and Khan (1997) was drawn from three sources: for the pre-reform period, they use the implicit deflator for capital accumulation estimated by

Chow (1993); for 1978-1990, they adopted the price series building materials as a proxy for overall investments; and for 1991-1994, they used the official fixed asset investment index. .
Another researcher, Young (2000) constructed an implicit deflator for fixed asset formation as residual between GDP deflator and the deflators for other component of GDP, including private consumption, government consumption, inventories and the import and export. However, the inherent risk of Youngôs complex method is that a measurement error in any these deflators would be passed onto *residual* investment deflator Hsueh and Li (1999) provide an implicit investment deflator for the period 1952-1995, based on data from the Annual Report of Statistics on Investment in Fixed Assets. Priced of investment are determined by taking the weight average of prices of machinery and equipment and prices of construction and installation. Wang and Yao (2003) said to construct a time series of physical capital stock from investment flows; they needed to know the average rate of depreciation of capital and an estimate of the initial level of the capital stock. Thus, they had adopted an overall depreciation rate of 5% as in Perkins (1988). Although some of the study had reported that investment physical capital had significantly generate economy growth but Crain and Lee (1999) report a negative relationship between state economic growth and various measures of private capital stock. The explanation of this result is because growth models are more appropriate for long-run behavior and investment rates may be less important in generating short term business cycle performance within sub-national economies. Additionally, one might speculate that this definition of the investment rate is too narrow, or that the technique utilized is too narrow, or that the technique utilized to allocate investment expenditure (on the basis of in-place capital stock) may not appropriate to reflect the regional variations in such spending (Moomaw and Mullen, 2002).

Labor

Cai and Wang (1999) and the World Bank (1997) found a significant contribution of labor mobility to the TFP and GDP growth rate during the reform period. Topel (1999) said that a limitation of growth accounting is that it is silent about how the labor market works during economic growth. Solow (1956) had demonstrated how total of the labour can influence the economy growth but the labor in his model is not refer to knowledge worker as the role of agriculture is more address in this model. Refering to the Neoclassical Market theory of growth, Cai (2002) had conducted a research to examine the impact of the comparative productivity of agricultural labor in China. The main issue here is allocation of labor between the agricultural and the industrial sectors and to measure the intersectoral allocative efficiency of labor, he used the ratio of labor productivity in agriculture to labor productivity of industry to indicate the degree to which the share of labor force exceed the share of output in agriculture disproportionately and the change in the intersectoral allocative efficiency labor. It is calculated by dividing agricultural value added (the primary industry GDP) by agricultural labor forces to obtain labor productivity of agriculture and industrial value added (the secondary industry GDP) by industrial labor forces to get labor productivity of industry and then calculating the ratio (Cai,2002). Under the assumption of no barriers to factor mobility, movement of capital and labor between sectors would result in equal value of marginal product for all factors among sectors (Cai, 2002). That is to say, the value of the comparative productivity of agricultural labor equals to 100%. The results suggest that the correlation between comparative productivity of agricultural labor and provincial growth is positively significant. Another method used by Wang and Yoa (2003) is data series on the Total Labor Force of Society to measure the labor input and this data series does not contain any information on quality of labor input. Young (2000) shows

that the overall growth of the working thus population thus arrived at is consistent with reasonable demographic and participation values.

Human Capital and Economic Growth

Since the concept of human capital was invented in the late of 1950s, there have been flooded with papers written about contribution of education to economic growth (Psacharopoulos, 1984). The most often cited early reference are Scultz (1967) for the United State, Denison (1967) for United State and other advanced countries and Krueger (1968) and Nadiri (1972) for less advanced countries. Human and physical capitals complement each other in the process of the economic growth. Griliches (1969), Psacharopoulos (1984), and Fallon and Layard (1975), among others, report that results consistent with the hypothesis that a higher stock of human capital enhances the rental value of machines. The early study on human capital focused on education and skill to increase agriculture productivity (Lucas, 1998). Even Scultz (1967) on his original analysis demonstrated that the yield on investment in physical capital such as plants and machinenary. The theory of human capital was enriched by Robert Fogel who incorporated nutrition and health as other important factors of human capital (Fogel and Eangermen, 1986) and his research suggested that technological change was made possible in part due of physiological changes of population industrializing economies (Fogel and Eangermen, 1986). Gary Becker then conducted several studies on family behavior and human capital investment (Becker 1965, 1976 and 1980).

A more recent work by Mankiw et al.,(1992) and Islam (1995) investigated the effect of human capital to economic growth in the long-run patterns and their analyses they assumed that each economy has attained, or is moving toward, steady state equilibrium. Mankiw et al., (1992) for example had tested the ability of this model to explain variations in per capita income and growth rates for three broad samples of countries over the 1960-85 periods, but Islam (1995) has argued that their work is not really representative of an appropriate test of the Solow model. As an alternative, Islam (1995) derives a dynamic panel estimation approach that is implemented within a fixed effects framework and his found findings underscore the importance of cross-country differences in the aggregate production functions that ultimately influence per capita income and its growth. The studies of economic growth and education recently, address the effects of educational on income and they indicate mixed findings but generally reveal positive relationships between educational spending and per capita income growth (Baldwin and Borrelli, 2008).

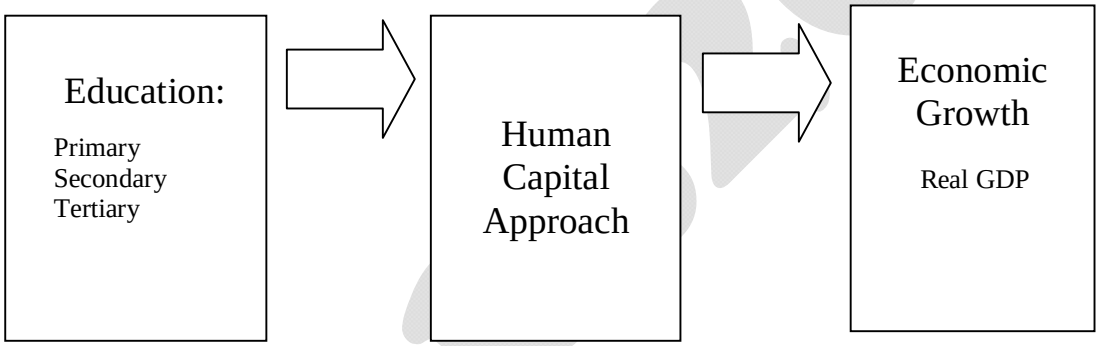
Ranis et al.(2000) tried to make connection between economic growth and human development from two chains. Firstly, chain A shown how GNP contributes through household and government activity and secondly, chain B suggested that as people become healthier, better nourished and educated so they will contributed more to economic growth. The results indicate that they are significant relationship in both directions, with public expenditure on health and education, notably female, especially important in the chain of economic growth to rise to virtuous or vicious circle Ranis et (2000). Some researches had been conducted to see how education indirectly effect economies on growth when there are increasing in population and employment (Li, 2005). Empirical studies on the relationship between education and local population and employment growth have been carried out with data at different geographical levels. Using a sample of U.S city data over 1960-1990, Gleaser et al.(1995) found city

population growth rates are positively related to initial human capital. In a later study in the US, Barkley et al., (1998) investigated the influence of school quality on South Carolina rural residential growth and found a positive effect. Analyses with U.S county data by Beeson et. al., (2001) demonstrate that the population growth rate is significantly related to county educational infrastructure.

RESEARCH METHODOLOGY

The quantitative method was used to construct as this study tries to explain the relationship between variables, ideally in form that enables prediction of outcomes from known regularities (Paynes and Paynes, 2004). This method used a deductive process and focused on secondary data. Thus, growth model using a cross-country data from year 1980 to 2007 was constructed and the data were taken from the *Statistical Yearbook* and *World Bank* data of Malaysia. A simple version of Solow model is illustrated by using Cobb-Dauglas form that has been used to measure the economy growth of Malaysia, rather than using the econometric inputs to output.

Figure 3.1: Framework of the Study



Development of the hypotheses

H_1 = Growth has positive effect with technology/TFP
H_2 = Growth has positive effect with capital
H_3 = Growth has positive effect with labor
H_4 = Growth has positive effect with human capital

RESEARCH FINDINGS

Descriptive analysis

Total Enrolment of Level Education in Malaysia

Figure 4.1: Total Enrolment of Education Level Trend in Malaysia, 1980-2007

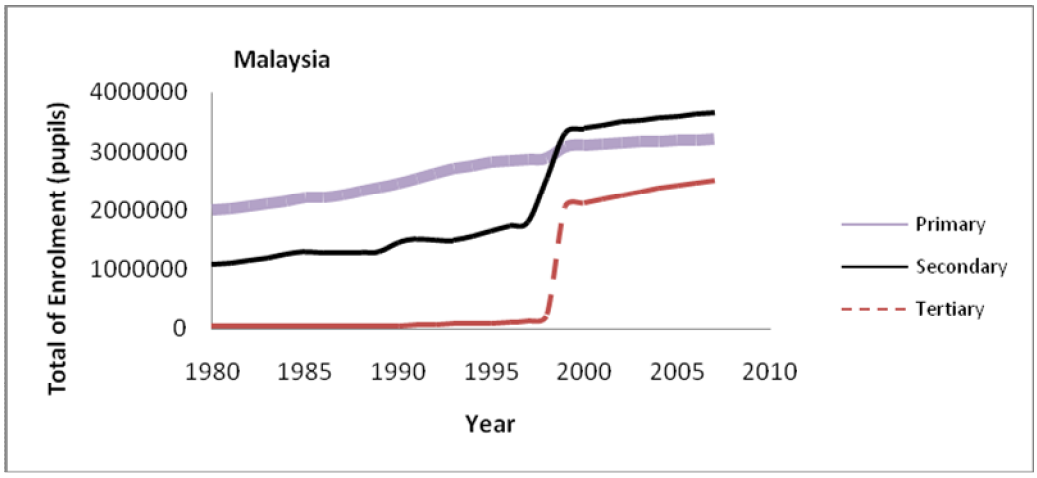


Figure 4.1 illustrates the total number of enrolment for primary, secondary and tertiary education in Malaysia as function of the year between 1980 and 2007. The graph shows that total of enrolment for primary education increased over time. The minimum of total enrolment in primary education is 2,000,900 pupils and the maximum of total enrolment in primary education is 3,217,155 pupils.

Table 4.1: Regression on Total Enrolment of Level Education in Malaysia, 1980-2007

	Coefficient	Standard Error	t-value	t-prob	R^2
Primary	1.20E-06	3.04E-08	39.4174*	1.0155-24	0.9835
Secondary	4.47E-07	4.59E-08	9.7480*	3.5967-10	0.7851
Tertiary	0.261	0.0272	9.5942*	4.99E-10	0.7797

* Significant at 5 percent level, two-tailed test

Table 4.1, row 1 shows that an increase of 1.2E-05 percentage points in the primary enrolment in Malaysia is associated with an increase in the real GDP by 10 percent. The relationship is positive and marginally significant with the strong R-Square value of 98 percent, among others, has stressed the importance of education at primary level in Malaysia. While the

total enrolment for secondary education increased at steady annual rate about 1 percent to 3 percent per year throughout the period 1980 to 1998, there is sharp and steady incline in total enrolment for secondary education throughout the period of 1999 to 2007. The range for level of enrolment in secondary education is 1,216,255 pupils and it standard division presents in the graph is the lowest among of the level of education enrolment. Table 4.1, row 2, shows that an increase in the secondary school enrolment in Malaysia is by 10 percent goes along with increase 4.4701E-06 percent in the Real GDP. The relationship is positive and marginally significant with the R-Square is of percent. Table 4.1, row 3, shows that an increase of 2.6 percent in the tertiary enrolment in Malaysia is associated with an increase in the real GDP by 10 percent. The relationship is positive and marginally significant with the R-Square of 78 percent.

Hypothesis Testing

H_1 = Growth Has Positive Effect With Technology/TFP

Table 4.4: Regression on Cross-Country Growth Rates in Malaysia, 1980-2007

	Malaysia
INTERCEPT	4.6232
	(4.6522*)
Gk	1.3276
	(6.8863*)
Gl	-1.4620
	(-0.05311*)
Gh	2.7134
	(0.8108*)
R^2	0.6467
Std. Error	2.37
F	17.0822

At first glance, the results of Malaysia in the Table 4.5 are generally consistent with the hypotheses. The sum of the coefficient of human capital variables is positive and significant. A 1 percent increase in capital will raise growth by 1.2 percent over a 27 year period.

H_3 = Growth Has Positive Effect with Labor

Table 4.9: Estimation of Output Elasticity to Labor Input in Malaysia

Dependent Variable Ln Real GDP

R^2	0.9548	*Sign. F*	5.11E-19
F	550.013		

Independent Variable	Coefficient	Std. Error	t-value	t-prob
Intercept	-1.8E+12	8.14E+10	-22.6091	1.27E-18
LnLabor	1.2E+11	5.13E+09	23.45236	5.11E-19

* Significant at 5 percent level, two-tailed test

In Malaysia, labor has positive and highly marginal significant effect on real GDP. Table 4.8 reveals the regression result for R-square of 0.95 which that mean, 95 percent the variation of real GDP can be explained by the variation of labor in Malaysia.

H4 = Growth Has Positive Effect with Human Capital

Table 4.12: Estimation of Output Elasticity to Human Capital Input in Malaysia

Dependent Variable Ln Real GDP

R^2	0.81755	*Sign F*	4.22E-11
F	116.51		

Independent Variable	Coefficient	Std. Error	t-value	t-prob
Intercept	9.4823	1.4220	6.6679	4.5E-07
Ln Human Capital	0.8715	0.0807	10.793	4.2E-11

* Significant at 5 percent level, two-tailed test

There is a strong relationship between human capital and level of real GDP. The estimated output elasticity of human capital is positive and marginally significant effects on real GDP in Malaysia (Table 4.11). There is 82 percent of the variation of real GDP that can be explained by the variation of human capital. There is also 0.87 percent increase in real GDP effects of increase inhuman capital.

DISCUSSION AND CONCLUSION

In previous studies, researchers have shown education can increase economic growth in Asia countries like China and India. Gylfason (2001) believed that natural capital is the most important asset may develop a false sense of security and become negligent about the accumulation of human capital and he also said ótthe countries with few raw materials (Hong Kong, Singapore, South Korea, and Taiwan) have done even better than the resources-rich ones (Indonesia, Malaysia, and Thailand). For this reason, the government of other countries started realising that the investment in education is able to increase the economic growth in their countries. Education is able to increase the economic growth directly or indirectly through the increasing of technology innovation, health and trade. Education is really important to maintain the balance of development. Thus, the government has made a few steps in increasing human capital. For example, the Malaysia government had increased 97.3 percent of the allocation for research & development and 23 percent from the whole total of the sector are for the education. Malaysia is seen as the country that is able to compete with the other developed countries in developing the potential of their human capital. Undoubtedly, the factor of the increasing of knowledge through education is the governmentôs agenda . The open policies of the government about the technology changes and the widely usage of foreign languages, for example, English, are able to help the country in achieving great economy compare to other countries. Based on total of enrolment at primary, secondary and tertiary education data from Malaysia, this research investigate the impact of human capital on economy growth. It is found that the result is consistent with applied model which is Solow model. The results show that technology, capital, labor and human capital have a significantly positive effect on the growth of economic. This research found that human capital is able to stimulate economy growth through innovation -

technology. Besides that, this research found Malaysia has great growth in stock of physical capital. According to Bhattarai, (2005) higher saving rate generates higher capital stock, which associated with a level of technology and workforce and a higher rate of economic growth. Thus, we can say that both Malaysia have a high saving rate. In conclusion, the findings of this current research is consistent with the augmented Solow model as it said that differences in saving, education and population growth can explain cross-country differences in income per capita. Thus, it can be said that a lot of entrepreneur could be created to generate economics of the countries as they part of human capital. To be a successful a entrepreneur, they have to learn to face the challenges of globalization, to enter the online market, marketing techniques and the proper governance, the current economic situation and also explore new opportunities even if the world economy threatened by recession. It is imperative for the government to provide opportunities for entrepreneur to increase their formal knowledge such as ICT skills and encourage them to participate in lifelong learning programs.

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