Education, Human Capital, Technology and Economic Growth in Malaysia

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Abstract : This study aims to determine the impact of education, human resources, and technology on economic growth in Malaysia using annual time series data for the period 1984-2019. This study uses an autoregressive distribution gap to cointegration approach to examine the relationship between human capital education, technology, and economic growth. The estimation results show that human resources in the form of middle and high school participation have a significant positive effect on economic growth. Based on the results of our research, it can be concluded that education has a significant impact on economic growth in Malaysia.

Keywords: Education, Human capital, Technology, Economic Growth

JEL Classification : A2,M12,M2

1 INTRODUCTION

Education is a necessity of life. When the structure of society is increasingly developing and complex, the need for knowledge and community empowerment will also increase. Education is a means to develop self-quality. From an economic perspective, education is the main tool that must provide a reflexive workforce, such as teachers, scientists, researchers, intellectuals, and thinkers.They are not part of the workforce used for the direct purpose of increasing work productivity. However, in this era of globalization, they are part of the economic circle because countries or companies really need them. Reflexive labor is not productive from the aspect of direct production of surplus-value.However, they have a net effect on the production of surplus-value in accordance with their respective fields. In addition, the education sector must also be able to provide trained productive personnel, for example, for direct labor for factories, food processing companies, automotive, textiles as well as various types of service companies.Their skills and abilities will provide added value or productive value directly to the company. It is they who realize what reflective labor has initiated and produced. So, the role of knowledge and empowerment of human resources is very important. The progress of a country, one of which is largely determined by the quality of management of the education sector.

Human capital does not position humans as capital like machines, so that it is as if humans are the same as machines, as in previous human capital theories. However, after this theory has become more widespread, human capital can actually help decision-makers to focus on human development by focusing on investment in education (including training).Many sources and education economists have said that education contributes to economic development. Various academic studies and empirical studies have proven this. Education will not only give birth to quality human resources (HR) (possessing knowledge and skills and · mastering technology) but can also foster a business climate that is healthy and conducive to economic growth.One of the characteristics of developed countries is the high level of education and mastery of technology, therefore education is emphasized to improve the quality and quality of human resources, such as training in skills, skills, and knowledge about the business world in order to create competitive, competent, creative human resources. , have broad insight and high integrity required by various business sectors, both industrial and other sectors (Lintsen,et al.,2018).

Human capital can be defined as the total amount of knowledge, skills, and intelligence of the people of a country. This investment (human capital) is carried out with the aim of obtaining a higher level of consumption in the future. The reason why education is Human Capital is that education is the most important investment in human capital to answer today's global challenges. Education is interpreted as an investment in the future because education itself is a tool to develop the economy and not just grow the economy. In modern educational management praxis, one of the five functions of education is a technical-economic function from the individual level to a broader level.The role of education as human capital is as a forum or tool to prepare a skilled workforce because education is one aspect that supports and is able to contribute to economic development. Therefore, education is highly emphasized to improve the quality and quality of human resources (Pablos & Tennyson,2016).

Economic development aims to increase the real income per capita of the population in the long run, followed by improvements in living conditions. As a driver of economic growth, it is necessary to accumulate resources or capital to increase the production capacity of a region. There are three types of capital needed in the accumulation process, namely physical capital (capital stock), human capital (human capital) and social capital. Human capital is an investment in humans in the form of expertise, norms and health which is obtained from the process of education, training and health services. Human capital affects the economy of a region or country by increasing the productivity of the economy's workforce and improving technology. Empirically, several studies

show the influence of human capital on economic growth (Sagala,2017).

The approach commonly used to measure the effect of human capital on economic growth is to use an approach to the factors forming human capital such as education and health. Economic development has the goal of achieving sustainable economic growth followed by an increase in the quality or welfare of life. Apart from being the output of development, the quality of human resources is also a determining factor for economic development. Increased investment in human capital results in increased access to technology, increased quality and labour productivity. Economic growth requires an increase in the real gross domestic product (GDP) per capita, that is, the expansion of the scale of production across countries, or the efficient use of economic resources to produce goods and services (Greenhalgh & Rogers, 2010).

Human capital has a central role in economic development, in addition to physical capital which has an effect on economic development. On the other hand, human capital tends to provide accumulative and long-term effects compared to physical capital. Human capital accumulation is expected to be one of the initial sources of sustainable development. Human capital enables humans to complete their work and generate income. Human capital in the form of knowledge also enables humans to master technology including information technology. Information technology refers to all technologies used to use information in all productive activities. Technology has the meaning as a means that has the purpose of making human life easier without losing the comfort of its users, while information has the meaning of a collection of letters or symbols in it or news where communication has benefits for the recipient. Information technology means a means that has information for its users in order to facilitate user activities in carrying out a productive activity. (Machado, 2015).

Increased production is an indicator of increasing community productivity. This increase in productivity encourages economic growth. Like other developing countries, Malaysia uses the productivity of its people to boost economic growth. (Rodionov, et al., 2020). The interrelationship between economic growth and human capital growth may be an important key to sustainable economic growth. This development does not only contribute to one aspect, namely economic growth, but is able to contribute to other aspects such as welfare and poverty reduction. the economic success of individuals as well as the whole economy depends on how widely and effectively people invest in themselves and the presence of technology can be the driving force of a modern economy, especially from the high-tech sector, but human capital is the fuel. The contribution of human capital can be analyzed from two perspectives, namely micro and macro. The micro perspective views that human capital is part of the production function of individuals, which in turn is related to the quality of human resources. Knowledge can have an impact on the mastery of technology and the existence of innovations made in terms of the production process. The result of this knowledge is efficiency in the production process which has the potential to increase productivity. On the other hand, the existence of expertise will make individuals more competent in the production process, thereby encouraging productivity. At the macro level, the contribution of human capital can be analyzed from the micro-aggregated contributions that are part of national economic development. This development has the impact of an increase in welfare, which is indicated by an increase in the level of GDP per capita.

2 LITERATURE REVIEW

The role of education in life is very important because, in the current era of globalization, the world of work demands quality and quality human resources, therefore the world of education inevitably has to be able to create a good forum in facilities and infrastructure as well as in the form of training for skilled workers.Human capital positions humans as capital like machines, so that it is as if humans are the same as machines, previous human capital theories. However, after this theory has become more widespread, human capital can actually help decision-makers to focus on human development by focusing on investment in education (including training) in order to improve the organization as part of nation-building. The handling of human resources as human capital shows that the returns from non-physical investment are much higher than investment in the form of physical development.

Education itself is a tool to develop the economy and not just grow the economy. In modern educational management practice, one of the five functions of education is a technical-economic function from the individual level to a broader level. The technical-economic function leads to the contribution of education to economic development. For example, education can help humans to acquire the knowledge and skills needed so that humans can survive and be able to compete in a competitive economic life (Bengtsson,et al.,2018).

Education is an effort to change humans to be more intelligent. However, intelligence here should not be interpreted as mere cognitive or intellectual intelligence, but complete human intelligence, total human intelligence in various fields of life. Physical capital, labor, and technological progress are the three main input factors in the production of national income. The greater the number of workers (which means a high population growth rate) the greater the national income and the

higher the economic growth. In developing and underdeveloped countries, population growth rates are higher than in developed countries.

However, in general, the economic growth rate in developed countries is higher. The development paradigm that refers to a science-based economy now appears to be increasingly dominant. This paradigm emphasizes three things. First, economic progress in many ways rests on the support base of science and technology. Second, the causal relationship between education and economic progress is getting stronger.Third education is the main motor of economic development dynamics that drives a long-term structural transformation process.

In developed countries, apart from being a consumptive aspect, education is also trusted as a human capital investment and becomes the "leading sector" or one of the main sectors. Because the government's concern for the development of this sector is indeed serious, for example, the political commitment of the education sector budget is not inferior to other sectors, so the success of education investment is correlated with progress in macro development (Oakes,et al.,2015).

Along with the development of human civilization, in the demands of modernization and globalization, quality education is an increasingly important requirement in order to survive in increasingly fierce competition. The need for the importance of quality education has been aligned with other primary needs such as clothing, food, and shelter. Without education, they will remain behind and be at the lowest social strata. The enthusiasm of parents, especially from the lower levels of society, to send their children to the highest and quality education level is an attitude that must be supported by all parties.

However, this spirit ran aground in helplessness due to the inaccessibility of quality education costs. Education is expected to produce quality human resources. If not, then this sector will also contribute to unemployment. There are at least three planning models in education related to its benefits. First, education is planned on the basis of a social demand approach. In this approach, educational programs are indeed made based on the demands that exist in society. People want to go to school, so various educational programs are offered to them. If people were able to think rationally, this approach would not be a problem. However, if people always want to enter an educational unit, even though they are not qualified, the result will not help much in the problem of unemployment (Lightfoot-Rueda,et al.,2016).

One of the characteristics of developed countries is the level of education and mastery of technology, therefore education is very much emphasized to improve the quality and quality of human resources such as training in skills, skills, and knowledge about the business world in order to create competitive, competent, creative human resources. broad insight and high integrity required by various business sectors, both industrial and other sectors.Education is a means of creating human resources for a company that wants to live long is a strategic matter. Therefore, in order to manage reliable management, managers must link the implementation of finding human resources with organizational strategies to improve performance, develop a corporate culture that supports HR innovation and improvement.

The strategic role of human resources in business organizations can be elaborated in terms of resource theory. Education is the most important investment vehicle for humans as capital in competing in the global era. Formal education alone cannot guarantee that humans can work, but it also requires supporting facilities or institutions such as job training institutions that exist outside of school.

Even college graduates are not ready to face the labor market when they leave school and have to be placed in their jobs through formal and informal training programs. Therefore a person's skills and skills in dealing with labor competition are greatly mediated by no matter how great and wide the education one has. each individually.Therefore it requires efforts and programs to create superior and high-quality human resources to face international competition because the world of work is very demanding to obtain highly varied human resources. With education, one's potential will be well directed, so that it can make humans efficient. Education also makes people more knowledgeable and have better abilities (Evenson & Ranis,2019).

The theory of human capital or human capital put forward by Becker (1985), explains that education can teach workers about skills that can increase productivity and workers will get higher income as well (Sadaf,2017). With an increase in workforce education, it is hoped that this will improve the quality of the workforce. In addition to human capital theory, a theory that is closely related to education is a theory proposed by Spence (1973) which is called the signaling theory (Wolf,2017). This theory assumes that there are two types of workers, namely good workers and poor workers. Good workers have higher productivity, while poor workers have lower productivity. However, if a worker has an equal educational background, then the company will pay a wage that is comparable or the same, even though one worker has better productivity compared to other workers. Therefore, workers with higher productivity choose to continue. education to a higher level than before to be able to give signals or signals to companies in order to get wages that are comparable to the education level.

Meanwhile, the human capital theory states that workers who have good productivity will get better wages from the

company because the company is assumed to have the ability to be able to differentiate the productivity of the workers who work in the company. So, workers who have better productivity will have a better income. On the other hand, workers who have continued their education to a higher level, namely taking more education than their previous education, do not necessarily have increased productivity. This can be due to the fact that the level of education that has just been taken, will only be used as a signal to the company that the worker already has a better level of education than before. If education is considered to increase the value and quality of human capital, then the formation of human capital is an important means of increasing economic growth. Therefore, if education is purely considered to be only a signal sign regarding the quality of individual education, then the education taken by a worker is considered not to increase his productivity. Now, education is considered as one of the prerequisites for getting a job. Apart from the government, many private institutions participate in providing educational facilities for the Indonesian people. There are many private educational institutions that promise to achieve degrees in a short period of time, in order to help their graduates get a job immediately.

The relationship between human capital, technology and the economy has a relationship and affects each other. A number of studies have found something similar. Xu & Li (2020), found a relationship between human capital and economic growth, while Chen (2021), found a relationship between investment in equipment (as a proxy for human capital) and economic growth for countries with high levels of human resources. low.

Human capital is something that affects the quality of human resources. The human resources in a country are its residents. The cointegration relationship between human capital and performance and an impact on national economic growth has been reported by Han & Lee (2020). Alfada, 2019 reported the findings of a positive relationship between human capital and economic growth in South Korea and Malaysia. Various studies have shown the same thing even though the variation in the relationship and the level of intensity of the relationship between human capital and the economy has different variations in each country.

Banerjee and Roy (2014) in their research concluded that the relationship between technology, human capital and economic growth is positive and in the long run they support and reinforce each other in a co-integration relationship. This reinforces the hypothesis that there is a strong cointegration relationship between human capital, technology and economic growth.

Economic growth is an indicator of a country's level of prosperity. Where economic growth is generally calculated based on the increase in the amount of production nationally at any time. The production itself is a combination of human and money factors where humans act as a mover and money play a role in bringing in raw materials, machines, equipment, land and production space. Human capital and financial capital play a role in the production and cannot be separated. The presence of technology increases human performance coupled with an increase in human capital can increase production. Where products can be produced faster and with better quality.

3 RESEARCH OBJECTIVE AND METHODOLOGY

This study uses the ARDL method to examine the long-term cointegration relationship between variables using secondary data. This study uses a human capital frame work in developing research with the following model:

$Yt = f(Kt, Lt, Ht)$

where Yt is output, Kt is money capital, Lt is labour, and Ht is human capital. In this study, we include technology as a driving factor for human performance. Since the drivers of human performance are technology and human capital we developed the following models:

$Yt = f(Kt, Lt, Ht, Tt)$

We convert both models and equations into the following econometric model:

$$\ln Yt = \beta 0 + \beta 1 \ln Kt + \beta 2 \ln Lt + \beta 3 \ln Ht + \beta 4 \ln Tt + et$$

where Yt is production output over time, Kt is money capital over time, Lt is labor over time, Hit is human capital over time and Tt is technology over time. The entire sample of this study comes from secondary data sourced from World Development Indicators (WDI) and Malaysian central bank database for the period 1984 to 2019 (35 years) based on data availability.

4 RESULTS AND DISCUSSION

Human capital has a significant positive effect on economic growth by 5%. More specifically, an increase in human capital will have an impact on increasing economic growth in accordance with theoretical provisions. This result strengthens the findings of other similar studies conducted for Malaysia by Alfada (2019), where the results of his research are that there is a significant positive relationship between human capital and economic growth. Another study from Banerjee and Roy (2014) reported similar results for India. From the results of the study, it is evident that human capital is capable of driving economic growth. The technology variable also shows the same result, which is positively and significantly related to economic growth at the 5% level. This means that technology also has a role in encouraging economic growth through encouraging human performance as well as human capital.

Human capital and technology both drive human

performance. Human capital is a collection of knowledge, expertise and experience that humans use for work and technology play a role in facilitating human work so that it makes humans more able to complete work more easily with better quality. These two factors are very important in promoting economic growth.

Table 1. Estimated Long Run and Short Run Coefficients

Long term results		
Variable	Coefficient	T ratio (p value)
lnKt	0.789	4.246*** (0.000)
lnLt	3.265	4.182*** (0.000)
lnTt	0.536	4.952*** (0.000)
lnTEt	0.52	3.329*** (0.002)
Constant	−120.246	−6.414*** (0.000)
Short term results		
ΔlnYt-1	−0.213	−3.063** (0.045)
lnKt	0.359	3.136*** (0.004)
lnLt	5.718	5.101*** (0.000)
lnTt	0.513	8.321*** (0.000)
lnTEt	0.241	3.309*** (0.003)
Constant	−60.722	−3.617*** (0.001)
Adjusted R	0.821	
Durbin-Watson statistic	1.732	
F statistic	21.262 (0.000)	

Reported R2 (Adjusted R), Durbin-Watson statistic, and F statistic show that the model is suitable. Table 1 presents the long and short term results of Model 2, which includes secondary school enrollment as a proxy for human capital. Long-term results show that human capital has a direct and significant relationship with economic growth at the 5% level. In other words, increasing middle school participation-based human resources significantly increases economic growth. This is consistent with both theory and reality because over the past decade, the rate of growth of the Malaysian economy has increased and remains very sustainable. This development, however, may be inseparable from the fact that Malaysia has experienced a large increase in the number of tertiary institutions (especially universities), which has led to an increase in enrollment rates as well as a substantial increase in the number of graduates produced respectively. year. In addition, the supply of labor in the labor market both in quantity and quality has also increased substantially.

Education is one of the mechanisms in developing human capital. Where when human capital develops it will be followed by an increase in human productivity. The increase in students can be interpreted as an indicator of an increase in human capital investment which in aggregate increases the productivity of society. This is important because when the productivity of society increases, the economy also increases and in the end human capital investment will also increase and the economy will increase and continue to form a cycle until prosperity is evenly distributed to all people with a better life..

Human capital is an important factor in the long-term process of economic growth. Empirical research such as research from Alfada (2019) and Banerjee and Roy (2014) shows a positive influence between the factors that make up human capital and economic growth. Human capital can drive economic growth whose impact is strengthened by technology that improves human performance.

5 CONCLUSION

The impact of human capital and technology on economic growth in Malaysia during the period 1984 to 2019 is a significant positive. Human capital and technology drive economic growth in Malaysia. Where the increasing national investment in human capital encourages the productivity of society nationally. The existence of technology that makes it easier for humans to work makes society more productive and in the end promotes better economic growth.

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