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The Impact of Human Capital Index on Economic Growth in Malaysia †

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Abstract: The purpose of this study was to investigate the impact of the human capital index (HCI) on economic growth (EG). Despite a consistent pattern between human capital capabilities and economic growth, there was no significant correlation between HCI and EG, while employment was positively correlated. HCI improves both labor force education and the health care commitment of a nation, two important factors affecting employment. Accordingly, the country's human capital development plan should improve the health and education of its citizens, including monitoring their health closely and providing quality education to students. In this study, we explore the relationship between human capital index accumulation (health and education) and economic growth in Malaysia by using a Dickey–Fuller test with an Augmented protocol from 1979 and Philperrons tests from 1988, which have been conducted.

Keywords: human capital index in Malaysia; economic growth; human capital; HCI in Malaysia

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1. Introduction

In Malaysia, the rapid advancement of the country requires high investments in human capital that will strengthen industrial growth, serve as a backbone for the country's development plans, and most importantly, accelerate its readiness for the Fourth Industrial Revolution (4IR). Therefore, human capital intellectual development is crucial for identifying a country's key investments as a means of better mobilizing economic growth, especially in a rapidly evolving business environment. Investing in people is crucial to maintain a competitive advantage. Although managing human capital has been widely discussed in the literature, there appears to have been no suitable method for forecasting human resources potential until the World Bank introduced the human capital index (HCI) [1]. Human capital index focuses on education quality and health outcomes for individuals (and society as a whole) [1,2]. According to [1], improving health and education among the nation's citizens would benefit the nation by the age of 18. In light of the comprehensive nature of the concept, this research is heavily based on the seminal work by the [2] and [1].

A long-term investment in people will yield positive results by highlighting the issues and potential of human capital, and these efforts will increase economic growth and eradicate poverty. However, since COVID-19 started in 2020, Malaysia's economy has deteriorated and faces extensive health and education challenges. Generally, the experience of the COVID-19 outbreaks throughout 2020 indicates that health and education have a significant impact on economic growth. World Bank data shows that the Malaysian economy was healthy between 1982 and 2019, as the gross domestic product (GDP) of the country averaged between 4% and more than 5% per year but dropped drastically

to –5.6% during the pandemic in 2020 (GDP per capita growth (annual percentage %)-Malaysia, 2021).

Nevertheless, managing human resources presents a major challenge for the country. According to [3], Malaysia will not face a lack of jobs, but a shortage of skills required for future jobs. Therefore, the country should increase its labor force output and calibrate the development of its people skills in accordance with the labour market's demands [4]. According to previous studies, Malaysian workers, particularly graduates, lack critical thinking skills, communication skills, language proficiency, and positive personality traits [5]; there is consequently a mismatch between employers' requirements and product offerings of higher education institutions. These situations may have contributed to the high rate of youth unemployment and, consequently, the moderate performance of the national economy. In spite of positive economic growth in 2017, the unemployment rate for graduates remained high (10.5%)-around three times the national unemployment rate in 2016. One article [6] cited Malaysia as having the third-highest youth unemployment rate in the Asia-Pacific region after Indonesia and South Korea. However, the country still maintains a lower unemployment rate compared to the other two countries due to its relatively stronger economy, lower population density, and lower corruption level [7].

Malaysia is ranked 62nd in the World Bank's 2018 human capital index, behind Singapore, which is ranked first; Malaysia scored 0.62 against Singapore's 0.88. The lowest HCI was found in Chad (0.27%) (Human Capital Index (HCI) (scale 0-1)-Chad | Data, 2021) with South Korea (0.84%), Japan (0.84%) and Hong Kong (0.82%) way ahead [8]. Even before the pandemic, in the fourth quarter of 2017, skilled employed persons decreased by 0.8 percentage points to 27.2% and the number of semi-skilled persons also decreased by 0.5 percentage points to 59.2 percent while the employed persons with secondary education has increased by 1.0 percentage point to 56.2% [9]. The employed persons with tertiary education decreased by 0.8 percentage points to 28.0% [9].

It is important to note that in Malaysia, the majority of employed persons do not have tertiary education. This may be caused by the fact that more low-skilled jobs are being created, since Malaysia does not pursue knowledge-intensive and innovation-driven activities. Today's generation should pay more attention to their education in order to increase the number of people with tertiary education in the workforce. As a result, it is crucial that intellectual development begins immediately by focusing on the health and education of the new generation in order to improve the capabilities of its workforce. However, Malaysia appears to place more emphasis on physical investment and less on people's well-being. Currently, there are several major infrastructure projects underway, such as the Pan Borneo Highway and the East Coast Rail Link (ECRL), which cost USD7.05 and USD10.5 billion respectively and are expected to promote economic growth [10]. The outcome of these rapid infrastructure advances certainly promotes development, but human capital remains the main driving force behind large-scale infrastructure projects.

Malaysia's budget for health and education is relatively small compared to the sums allocated for infrastructure. Although the health budget allocation for the federal government was RM31 billion, an increase of 6.7% or 10% of the total RM297 billion, it covered the entire federal government. According to the budget, development expenditure was RM56 billion in 2020. The budget plan was heavily criticized as it again assigned more funding for construction and infrastructure projects than for its people. RM69 billion was allocated for the purposes of infrastructure and only RM50.4 billion for education.

The potential for Malaysia's development is excellent. Global investors make up the largest portion of the economy's support, led by China (16.7%), Singapore (12.9%), the United States (8.3%), Japan (7.1%) Thailand (5.6%); its main markets, which contribute 51.3% of its exports, are China (13.9%), Singapore (13.9%), the United States (9.1%), Hong Kong (7.5%) and Japan (6.9%) [11]. The country earned a gross domestic product (GDP) of US364.7 billion from its economy with a population of more than 32.7 million people [12]. Compared with its neighbours such as Singapore, Thailand, and the Philippines, the country is doing well [13]. The country's economic growth, high labor participation rate (68.4%), and low

unemployment rate (3.3%) [14] have helped Malaysia rank 17th globally for manufacturing competitiveness (see Deloitte Touche Tohmatsu's Global Manufacturing Competitiveness Index 2016-Deloitte.com). In terms of technology and innovation, Malaysia ranked 37th out of 127 countries, and 8th in Asia in the Global Innovation Index 2017 conducted by Cornell University, INSEAD and WIPO [15]. In addition, the Readiness for the Future of Production Report (2018) identified Malaysia as a well-positioned country to benefit from Industry 4.0 [16]. As such, Malaysia has a huge potential for development in the near future, but it must focus on improving its greatest asset, human capital, rather than just its physical assets.

In this study, the aim is to investigate the relationship between education and health, which are the elements in the HCI, with economic growth in Malaysia. Robust studies have examined how human resources affect firm performance and its ability to establish competitive advantages [17–19]. However, a study on the correlation between health and economic performance remains largely contested, despite the fact that health plays an important role in EG. The reason for this is that the data is too complex to quantify [20–23]; several recent studies have attempted to explain the link of health and education with EG [24,25], however, they were less comprehensive as they were done within a specific country or region. (This is claimed as less effective for many reasons: for instance, a study used nonparametric and a semiparametric analysis on a sample of 100 countries over the period from 1970 to 2014).

Currently, HCI is being actively studied, so there is only a limited amount of evidence discussing the index. Therefore, this study aims to fill the gap in the literature by exploring the effects of the human capital index through education and health on economic growth in Malaysia.

2. Literature Review

The following literature discusses the HCI concept, the education and health elements of the HCI and the relationship between human capital (HC) and economic growth (EG).

Defining HCI: In 1990, Amartya Sen and Mahbub ul Haq, together with Yale University professor Gustav Ranis and Lord Meghnad Desai, established the HCI. Continuing this work, health and education are used to predict what an 18-year-old born today might achieve, given the risks of a country where education and health are poor. HCI measures productivity in relation to a benchmark of a complete education and full health. It ranges from 0 to 1. A child born today can expect to be only ×*100 percent as productive as a future worker as they would be if they had a complete education and full health [1]. Using HCI, a standardised index can be used to measure HC capabilities effectiveness in a country, specifically a country's productivity. It is also can be used as an indicator of a country's HC growth as claimed; a person with a good education and good health benefits society and is the main factor behind economic growth [26,27]. Thus, education, health, and productivity are the main direct mechanisms through which human capital influences economic growth. According to the HCI model, investing in human capital can have significant economic benefits in the long run, especially when it comes to economic growth, particularly in the employment sector [1]. The relationship between employment and economic growth is clear, which was evident during the recent pandemic in 2020/21 [28]; Malaysia's unemployment increased by 4.5% from 3.3% (2019) when the EG declined in 2020 [12].

The health aspect of the HCI: several studies have found a reciprocal relationship between economic growth and healthcare spending. A country with high healthcare expenditures sees high economic growth; but poor countries with low GDP ratios cannot spend as much on healthcare, eventually causing them to become poorer [29,30]. Studies show varying relationships between healthcare spending and economic growth. A study by [31] examined the stationarity and cointegration of variables across 13 MENA countries with respect to economic growth (GDP) and healthcare spending over the period of 1995 to 2005. It was found that healthcare expenditure and economic growth are closely related,

with a negative relationship between healthcare spending and gross domestic product, and that healthcare spending is a necessity in the countries studied [29,32]. Measuring the health spending is challenging; hence, the correlation between health and EG is hard to demonstrate as it requires long-term observation and possibly requires both qualitative and quantitative methods [29,32].

The education aspect of the HCI: there have been many empirical studies that have shown education has a strong effect on economic growth and productivity in many countries, including [33] who found primary and secondary education have a causal impact on economic growth and productivity in India, [34] who found primary and secondary education have a causal influence on productivity, and [35] who found higher and secondary education had positive effects on economic growth. According to [36], their study looked at 14 countries in the Middle East and North Africa region and found that average human capital influences growth but does not affect productivity. In a study by [37], 94 developed and developing country educational attainment levels were examined. The author found that human capital positively impacted productivity growth. In the study by [38], an increase of 1% in school enrollment rates led to an increase between 1 and 3% in GDP per capita. The study by [39] indicated that current educational expenditures lead to economic growth in the future. According to [40], education in Malaysia has a positive significant effect on growth in the long run, with secondary education having a significant positive effect compared with primary and tertiary education.

The HCI and Economic Growth: the majority of research on HC and EG shows a positive correlation [41,42] and a variety of HC variables were analyzed for their impact on EG, including human resource functions, company size and culture, corporate strategy, customer satisfaction, and company structure; the results mostly showed indirect effects on EG. In order to gain more direct and conclusive evidence, it was claimed that the HC and EG correlation required quantitative and qualitative analyses [43,44]. Recently, many studies have shown some positive results in terms of accounting models, and the studies have stressed the importance of measuring changes in the quality of the labour force, measured by qualifications, health and higher skills, when attempting to account for economic growth over the long run.

3. Material and Methods

According to the discussion, it is difficult to prove the relationship between education, health and EG. In this study, time series analysis was used to test for stationarity in order to provide insight into the relationship in Malaysia. A Dickey–Fuller test with an Augmented protocol from 1979 and Philperrons tests from 1988 have been conducted. The only level at which the data were stationary was at the level associated with economic growth. At the second and first differences, the human capital index (HCI) and employment rate (UE) were sufficient. The following criteria were used to test the empirical models:

$$\text{Model 1: } \mathrm{LnEG_t} = \alpha + \beta_1 \mathrm{D_2HCI_t} + \varepsilon_t$$

$$\text{Model 2: } \mathrm{D_1LnEM_t} = \alpha + \beta_1 \mathrm{D_2HCI_t} + \varepsilon_t$$

where the variables are measured based on Table 1.

Table 1. Measurement of variable.

Variables	Definition	Sources
Index of Human Capital (HCI)	Index of Human Capital per Person for Malaysia, Index, Annual, Not Seasonally Adjusted from FREDD economic database	[45]
Economic growth (EG)	Economic growth based on % change of Gross Domestic Product from World Bank data	[13]
Employment rate (UE)	Employment rate based on total labour from World Bank data	[46]

As part of the procedure to validate the results, a diagnostic test called an auto-correlation test used the Breusch Godfrey and Serial Correlation LM test [47,48]. Time series analysis was used to perform the Eviews 9 statistical software, and the findings are presented in the following section.

4. Result

A total of 37 observations are included in this study that extracts data from 1982 until 2019. All the necessary estimation procedures had been completed in order to report a meaningful discussion. In Table 1 below, a descriptive statistic is presented to illustrate the characteristics of the data used in this study. According to the table, the data for HCI were normally distributed. Economic growth and unemployment have been transformed using the log transformation to standardize their values. All preliminary descriptives that meet the criteria qualify for the next step of the analysis. And the descriptive statistics result is shown in Table 2.

Table 2. Results for descriptive statistics.

Variables	Mean	Jarque Bera Test
EG	5.7377	33.23007 (0.0001) ***
EM	62.91	28.11942 (0.0001) ***
HCI	2.5547	2.6474 (0.2752)

*** denotes a significant level at 99% confidence level.

The final results were presented in Table 3 below. There was insufficient evidence to support the relationship between the human capital index (HCI) and economic growth (EG). This indicates that the data failed to reject the null hypothesis between the two variables. Interestingly, there is a significant positive relationship between the human capital index and the employment rate at a 5% level. The results suggested that as the human capital index increases by 1%, the employment rate increase by 0.0089%. However, the effect of the human capital index on economic growth failed to capture a significant relationship. Diagnostic testing shows that both estimated models did not suffer from the serial correlation, as the *p*-value was significantly greater than 0.05 on the Breusch–Godrey test.

Table 3. Results for simple linear regression analysis.

Variables	Model 1 (Economic Growth)	Model 2 (Employment Rate)
D2HCI		
β	8.6818	0.0089
t-value	0.934963	2.4319
p-value	(0.3562)	(0.02) **
Constant		
β	2.2538	4.1182
t-value	7.048221	4.192
p-value	(0.0001) ***	(0.001) ***
R-Squared	0.0243	0.1445
Breusch Godfrey serial correlation LM test		
p-values chi-square	(0.5212)	(0.360)
No of observations	37	37

*** and ** denotes a significant level at 99% and 95% confidence level respectively.

5. Discussion

Human capital index (HCI) and economic growth (EG) have no significant relationship in this study; however, there is a significant relationship between HCI and employment. The results indicate adverse consequences, despite the importance of HCI and EG being discussed here. The role of the community itself, the well-being of friends and family, and other factors can adversely affect healthy and educated individuals. HCI was also found to be based on years spent in school, and returns to education, based on the index of human capital per person extracted from the Fredd database in this study. Fredd evaluated the HCI solely on the basis of the number of years of education, without considering educational quality or healthcare quality. It would be useful to include these data in the future. A number of studies have found that healthy human capital is positively correlated with economic growth; however, as discussed, establishing a cause-and-effect relationship between the two is challenging. For instance, when a company invests in the health and education of its employees, this will likely result in greater employee productivity, and this in turn will improve the company's productivity. It is, therefore, possible that this effort will have an effect on EG if it is successful in increasing the output of the company's industry. Investment in training helps to create a skills and knowledge base and thus helps with the absorption of new technologies which leads to higher production and thus economic growth. With highly qualified workers contributing to high productivity and strong local economic growth, it may increase the GDP of a country. Furthermore, more research is required, but the findings of this study indicate that trained and educated populations can contribute positively to economic growth when they act according to sound principles.

The findings are in line with the concept of employment being closely linked to a country's performance and could thus be used to eradicate poverty. A country's performance is heavily dependent on employment and would alleviate poverty, thus enhancing life quality. It supports the literature review's assertion that if an individual has acquired skills before entering the labor market, they are capable of contributing to the overall productivity of the country. As a result, education and health are regarded as being the two key aspects of HCI that should be improved in order to increase HC productivity. These findings are consistent with the results of previous studies indicating that HCI has a positive and significant relationship with employment. Several studies have demonstrated that human capital can significantly contribute to economic growth when health and education are improved [49–51].

6. Conclusions

Several important points are highlighted in this study; by exploring the connection between human capital accumulation (health and education) and economic growth, this study contributes to the ongoing debate. Human capital has a limited impact on economic growth, necessitating further evidence that HCI has a significant effect on EG and

employment. As discussed, the two important areas of human capital development and employment are vital to the economic development of the country. Therefore, the study concludes that urgent interventions are needed to improve research and development, as well as investments in the well-being of the people and the effective use of human capital to promote growth while reducing externalities or spillovers. Malaysia's human capital development (HCD) plans should be taken more seriously, and it should improve the health and education of its citizens to become a developed country—a vision of 2020 that is considered a failure. According to previous studies discussed in this paper, physical assets are necessary to sustain economic progress, but the economy itself must also have a more skilled labor force. No matter how important physical capital is, the development of a developed nation that has been dreamed of for so long will not be achieved without skilled human capital.

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