

MANAGING NATION BUILDING THROUGH HUMAN CAPITAL ACCUMULATION: ASEAN PERSPECTIVE

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Abstract: This paper aims to analyse how the ASEAN-5 countries manage nation-building through human capital accumulation. This quantitative study analysed the macroeconomic and human capital data of 5 ASEAN countries from 1970 to 2016. The independent variables incorporated in this study are physical capital, population growth, human capital and trade openness. The theoretical framework of this study is based on Mankiw, Romer and Weil's endogenous Human Capital Augmented Solow model of economic growth. Ordinary Least Squares estimation technique was employed and the empirical results of this study deduce that human capital has a significant positive impact on economic growth in Malaysia and Singapore. Physical capital was found to have a significant positive impact on economic growth in Indonesia and Thailand. In Philippines, Indonesia and Thailand, it is demonstrated that population growth has a significant negative impact on economic growth, while trade openness is inferred to have a significant positive impact on economic growth only in Malaysia.

Keywords: human capital, education, economic growth, ASEAN-5, OLS

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Introduction

With the strong emphasis being placed on enhancing social welfare, development and sustainability in the Association of Southeast Asian Nations (ASEAN), human capital is deemed as the engine that powers economic growth (ASEAN, 2015; Chang et al., 2016). Nations recognize the importance of managing their human resources and organisations are expected to implement human resource management practices that will enhance not only their productive capacity but also that of the nations they are situated in. Human capital refers to the skills, knowledge and abilities acquired through schooling, experience, parental upbringing and training that are accumulated and embodied in individuals (Schutt, 2003). Human capital is considered a core resource of organisations as the utilisation of human capital in various activities, services and processes fuels not only the growth of organisations but also the economy's growth (Neeliah and

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Seetanah, 2016). Rasiah (2009) emphasized the significant role that globalization had in creating fundamental structural changes to the economy, transforming the labour market landscape. Education is considered as a major source of human capital and a crucial investment for nation building (Dissou et al., 2016). The neoclassical growth model by Solow (1956) proposed that an economy's steady-state level of output, and thus economic growth, is determined by its level of technology, rate of saving (physical capital) and population growth (labour), all of which are treated as exogenous.

However, Solow's growth model fails to capture the effects of human capital on economic growth. Consequently, Mankiw, Romer and Weil (1992) argued for a human capital-augmented Solow growth model (MRW model), which acknowledges human capital as a key source and determinant of economic growth. It is also postulated that human capital boosts the magnitude of the contribution of foreign direct investment (FDI) and trade liberalization to an economy's growth (Khalid, 2016). Hence, in the pursuit of elevating social welfare, development and sustainability among the ASEAN Member States (AMS), the study of the contribution of human capital in fostering and promoting economic growth has been of particular interest to researchers and policymakers within ASEAN and around the globe. This paper serves to study and shed some light on the role of managing human capital and other macroeconomic factors in determining economic growth in ASEAN-5 countries. This paper aims to (1) identify the macroeconomic determinants of economic growth besides human capital and (2) investigate the impact of human capital and each macroeconomic determinant on economic growth in ASEAN-5 countries, in terms of direction and magnitude. The remainder of this paper is organized as follows: The second section provides a review of existing literature. The third section outlines the research methodology employed in this research, while the fourth section presents a discussion and analysis of the results generated. Finally, there is a conclusion of the study's findings, offering appropriate policy recommendations.

Literature Review

There have been a number of studies (Tahir and Azid, 2015; Makun, 2017; Ullah, 2018) that have examined the interactions between macroeconomic variables and economic growth or nation-building, predominantly human capital, population growth, physical capital and trade openness. Both individually and collectively, these variables have been considered to impact significantly on economic growth across the globe. The MRW model developed by Mankiw, Romer and Weil (1992) employed secondary education enrolment rates as a proxy for human capital and proposed that human capital is a key driver of economic growth. Moreover, Ullah (2018) also found, through an empirical study using a vector error correction model (VECM), that human capital, measured by secondary school enrolment, significantly contributed to Pakistan's economic growth from 1980 to 2012. Such results have been supported by other studies concerning other countries (Munir and

Arshad, 2015; Neeliah and Seetanah, 2016; Makun, 2017; Qadri and Waheed, 2017; Tyndorf and Glass, 2017). In conjunction with a significant positive relationship between human capital and economic growth, Qadri and Waheed (2013) discovered that low-income countries reaped higher rates of return from human capital on their economic growth. Besides, Tsai, Hung and Harriott (2010) showed that a secondary level of education had a more significant contribution towards developing economies' growth than for developed nations, while tertiary education was crucial for growth in both developing and developed nations. Despite the number of studies which revealed a significant positive relationship between human capital and economic growth, a number of authors still question this relationship due to the differences in the empirical results (Tahir and Azid, 2015; Benos and Karagiannis, 2016). The neoclassical growth model developed by Solow (1956) proposed that higher population growth negatively impacts economic growth. Afzal (2009) investigated the impact of rapid population growth on Pakistan's economic growth and observed an inverse relationship. In support of these findings, Dao (2012) documented a negative relationship between population growth and per capita GDP growth in the sample of 43 developing economies using Ordinary Least Squares (OLS). Several other authors have also found a similar relationship in their respective studies (Chang et al., 2014; Ahmed and Ahmad, 2016). There is debate among academics on the role of population growth and the economy and whether that relationship is negative or positive (Rahman et al., 2013; Nwosu et al., 2014; Garza-Rodriguez et al., 2016). Solow's (1956) growth model proposed that heightened physical capital accumulation contributes to economic growth. The work of Neeliah and Seetanah (2016) established a positive relationship between physical capital stock and economic growth in Mauritius from 1971 to 2001 through a VECM. Furthermore, research by Munir and Arshad (2015) on Pakistan from 1973 to 2014 revealed that physical capital had a significant positive correlation with economic growth. Many authors have also supported this significant positive relationship between physical capital accumulation and economic growth in their respective empirical works (Trejos and Barboza, 2015; Su and Bui, 2015; Tahir and Azid, 2015). Similar results have been revealed in regard that wealthier nations reap higher returns on physical capital (Qadri and Waheed, 2013) and that private investment is vital to economic growth. There are however other studies that reveal different results (Lean and Tan, 2011; Ewubare and Ogbuagu, 2015) and is a common theme in the current research, the contradictory nature of empirical research relating to the factors which impact on economic growth. The human capital growth model and endogenous growth model developed by Lucas (1988) and Romer (1990) propose that trade positively impacts economic growth. Based on a study by Keho (2017) which investigated the relationship between trade openness and economic growth in Côte d'Ivoire from 1965 to 2014, it is highlighted that in the short- and long-run, trade openness fuelled the country's economic growth. Similarly, Tahir and Azid (2015) established a positive correlation between trade openness and economic growth in

a sample of 50 developing economies from 1990 to 2009 using a fixed effects model. In Ullah's (2018) paper, trade liberalization was also found to inflict a significant positive impact on Pakistan's economic growth from 1980 to 2012. These interactions also corroborate with the empirical findings of other research (Mohsen and Chua, 2015; Su and Bui, 2015; Makun, 2017). Additionally, Awojobi (2013) found that exports had a significant positive correlation with Greece's economic growth, thereby making this an export-led growth. Awokuse (2008) also revealed a similar relationship between imports and Peru's economic growth, which makes this an import-led growth. However, the positive relationship between trade openness and economic growth was not revealed by all the literature, as research by Bajwa and Siddiqi (2011); Hye (2012); Hye and Lau (2015) revealed contradictory results.

The hypotheses of this study are as follows:

H1: Human Capital has a significant relationship with economic growth.

H2: Population Growth has a significant relationship with economic growth.

H3: Physical Capital has a significant relationship with economic growth.

H4: Trade Openness has a significant relationship with economic growth.

Methodology

The current paper adopts a combination of the models employed by Mankiw, Romer and Weil (1992) and Ullah (2018) to study the impact of human capital, population growth, physical capital and trade openness on the economic growth of the ASEAN-5 countries from 1970 to 2016. The model specification is as below:

$$GDPC = f(K, POP, HC, OPEN) \quad (1)$$

Where GDPC represents economic growth; K denotes physical capital; POP represents population growth; HC denotes human capital; OPEN represents trade openness. All the variables are expressed in natural logarithms. Time series data is used in this study. Gross Domestic Product (GDP) per capita is used as a proxy for economic growth, gross capital formation is employed as a proxy for physical capital, population growth rate is used as a proxy for the 'n' component in population growth, primary school enrolment rates are used as a proxy for human capital, and the sum of imports and exports as a share of GDP is used as a proxy for trade openness. These proxies are selected based on past literature (Qadri and Waheed, 2013; Rahman, Saidi and Mbarek, 2013; Benos and Karagiannis, 2016; Keho, 2017). Time series data from 1970 to 2016 for the aforementioned indicators employed in this study are obtained from the World Bank. Additionally, the primary school enrolment rates for Singapore are extracted from the Government of Singapore's database. The econometrics estimation method employed in this paper is Ordinary Least Squares (OLS). With OLS, the individual impact of human capital, population growth, physical capital and trade openness on the economic growth of each of the ASEAN-5 countries can be estimated. OLS results also provide an illustration on the scale and direction of the relationships between the

independent variables and economic growth. This estimation is facilitated by EViews software.

Results and Discussion

This section presents the OLS results generated by EViews. The OLS results are segregated into five different models according to the individual ASEAN-5 countries. The impact of each explanatory variable on each ASEAN-5 country's economic growth is analysed individually and compared with the five countries. With regards to physical capital, it is revealed that this variable positively impacts economic growth in all countries except Singapore. However, physical capital appears to be statistically insignificant in 3 out of the 5 countries, namely Malaysia, Singapore and Philippines. Similarly, population growth inflicts negative effects on economic growth in all countries except for Singapore, where a positive impact is observed. Nevertheless, population growth is found to be statistically insignificant in Malaysia and Singapore. Moving on to the main focus of this study, it is identified that human capital plays a positive role in elevating economic growth in Malaysia, Singapore and Indonesia, yet is observed to impede economic growth in the Philippines and Thailand. Moreover, human capital appears to be statistically significant in Malaysia and Singapore only. Lastly, it reveals that trade openness has a positive relationship in all ASEAN-5 countries except for Indonesia. However, trade openness is found to be statistically significant in Malaysia only. In Malaysia, human capital and trade openness are statistically significant in determining economic growth at 1% significance level, while physical capital and population growth are found to be statistically insignificant. Human capital has a significant positive impact on Malaysia's economic growth, whereby a 1% increase in human capital, specifically in primary school enrolment rates, leads to a 16.15% rise in economic growth while holding other variables constant. This is consistent with the MRW model (Mankiw et al., 1992), the human capital growth model (Lucas, 1988) and Romer's endogenous growth model (Romer, 1990) those argue a common notion that human capital fosters economic growth by enhancing productivity and inducing spillover effects in the form of knowledge, technology, R and D and innovation. With the establishment of these favourable growth effects on human capital, the 11th Malaysia Plan has also placed strong emphasis on elevating human capital development on Malaysia's journey towards achieving Vision 2020. Furthermore, trade openness also has a significant positive impact on economic growth in Malaysia, though this effect is much smaller than the effect stemming from human capital. Numerically, a 1% increase in trade openness is associated with a 0.989% increase in GDP per capita. This is consistent with the growth models (Lucas, 1988; Romer, 1990), which assert that trade provides countries with access to a bigger pool of global human capital and triggers positive spillover effects in a country. Since Malaysia is a developing country, this finding is supported by a study on developing countries by Tahir and Azid (2015). In comparison with the other models, Malaysia experiences the greatest positive

effect on trade openness. This could be as a result of Malaysia's position viz-a-viz natural resources, such as rubber and palm oil, as well as having a tropical climate that accommodates the growth of agricultural commodities. These resources form a large part of Malaysia's export sector and render Malaysia as a beneficial trading partner for the ratification of trade agreements. Therefore, increased demand for these products and external forces from foreign competition motivate Malaysian firms to improve efficiency and enhance productivity, which in turn accelerates Malaysia's economic growth. In Singapore, human capital is the only predictor variable found to be statistically significant in predicting Singapore's economic growth at 1% significance level. The OLS results reveal that a 1% rise in human capital causes a 17.60% rise in economic growth in Singapore. This is plausible based on the MRW model (Mankiw et al., 1992), the human capital growth model (Lucas, 1988) and Romer's endogenous growth model (Romer, 1990). These models claim that human capital in the form of education drives economic growth by improving labour productivity and engendering positive spillover effects and externalities. Additionally, it is observed that Singapore receives the largest positive impact on human capital among the ASEAN-5 countries. This is probably because Singapore is the only high-income economy being analysed in this study. Hence, it is possible that Singapore possesses more enhanced technological and innovative capabilities, thereby elevating the productivity contribution stemming from Singapore's human capital compared to human capital in middle- or low-income countries within the ASEAN-5 classification. Moving on to the Philippines, the regression results demonstrate that population growth is the only statistically significant predicting variable in influencing Philippines' economic growth. Population growth is seen to have a significant inverse relationship with economic growth in the Philippines, which supports the notion that heightened population growth dampens economic growth through the lowering of capital-labour ratio as claimed by Malthus (1798) and Solow's (1956) growth model. The empirical evidence of this study shows that a 1% rise in population growth leads to a 9.90% decline in economic growth in Philippines. Hence, this finding proposes that lowered population growth rates are an important consideration in improving economic growth in the Philippines. With Philippines' manufacturing sector accounting for almost a quarter of its GDP (Republic of the Philippines, no date), this signifies that machinery and equipment play a key role in driving economic growth in the Philippines. Hence, the capital-labour ratio of the Philippines must be closely monitored to ensure that the country is able to reap the growth benefits from its physical capital in the manufacturing sector. In saying that it has to be remembered that lower population growth is advantageous to the Philippines probably because it will raise its capital-labour ratio in its manufacturing sector, thereby subsequently improving individual output per worker and economic growth. With reference to Indonesia, it is observed that physical capital and population growth are statistically significant in determining economic growth in Indonesia, whereby the former inflicts a significant positive impact on economic

growth at 5% significance level while the latter inflicts a significant negative impact on economic growth at 1% significance level. This supports the notion of Solow's (1956) growth model, which argues that an increase in physical capital accumulation and decrease in population growth collectively contribute to the rise of capital-labour ratio, thereby ultimately promoting economic growth. Additionally, the impact of Indonesia's physical capital accumulation and population growth are seen to inflict the most significant negative impact on economic growth among the ASEAN-5 countries. From the coefficients, it is interpreted that a 1% increase in physical capital accumulation results in a 0.976% rise in economic growth. However, the impact of population growth on Indonesia's economic growth is substantially more significant than the impact of physical capital accumulation, whereby a 1% increase in population growth induces a 10.611% fall in Indonesia's economic growth. With these two combined effects, it is plausible that Indonesia's capital-labour ratio is carefully tracked to ensure that the country does not encounter congestion effects and negative dependency effects. These consequences tend to be more noticeable in Indonesia since its manufacturing sector has been the largest contributor to Indonesia's GDP (Ribka, 2017), which depends heavily on both physical capital and human resources. Finally, with regards Thailand, there are close similarities with Indonesia, as the regression results reveal almost identical findings in terms of physical capital and population growth. Physical capital and population growth are found to be the only predicting variables that are statistically significant in influencing economic growth in Thailand, whereby physical capital is significant at 5% significance level while population growth is significant at 1% significance level. Similar to Indonesia, physical capital has a significant positive effect on economic growth, whereas population growth has a significant negative effect on economic growth. Numerically, a 1% increase in physical capital accumulation leads to a 0.332% increase in Thailand's GDP per capita, while a 1% increase in population growth depresses GDP per capita by 7.999%. These findings corroborate with Solow's (1956) growth model, which claims that increased physical capital accumulation effects coincide with reduced population growth in order to fuel economic growth. Since Thailand's manufacturing sector is expanding rapidly (Oxford Business Group, 2018) and with the salience of increased physical capital accumulation and reduced population growth can be attributed to this phenomenon as manufacturing relies heavily on fixed assets and labour. Therefore, this necessitates the maintenance of Thailand's capital-labour ratio at an optimal level in order to be able to acquire the growth benefits from its manufacturing sector.

Table 1. OLS Results for ASEAN-5 Countries from 1970 to 2016

Variable		C	LNK	LNPOP	LNHC	LNOPEN	R-squared	Prob(F-Statistic)
Model 1 - Malaysia	Coefficient	-67.961	0.012	-1.417	16.146	0.989	0.919	0.000***
	Prob.		0.953	0.258	0.000***	0.000***		
Model 2 - Singapore	Coefficient	-72.500	-0.475	0.062	17.600	0.641	0.793	0.000***
	Prob.		0.241	0.831	0.000***	0.321		
Model 3 - Philippines	Coefficient	30.937	0.338	-9.900	-1.188	0.004	0.821	0.000***
	Prob.		0.2010	0.000***	0.6129	0.9860		
Model 4 - Indonesia	Coefficient	24.461	0.976	-10.611	0.034	-0.205	0.861	0.000***
	Prob.		0.0019**	0.000***	0.968	0.630		
Model 5 - Thailand	Coefficient	23.980	0.332	-7.999	-0.767	0.109	0.977	0.000***
	Prob.		0.012**	0.000***	0.216	0.606		
Note: *** refers to 1% significance level in rejecting the null hypothesis; ** refers to 5% significance level in rejecting the null hypothesis								

Conclusion

This paper sheds light on the relationship between human capital and other macroeconomic determinants on economic growth in the ASEAN-5 countries from 1970 to 2016, using OLS. Based on the OLS regression results, physical capital is found to have a significant positive relationship with economic growth in Indonesia and Thailand. This suggests that increased investment in the right types of fixed assets is vital in fostering economic growth as it enhances production efficiency as well as raises capital-labour ratio, which substantially elevates productivity. Moreover, it is also observed that population growth is statistically significant in predicting economic growth in Philippines, Indonesia and Thailand, whereby there is a negative relationship. Population growth is seen to have the most significant effect on the majority of models and in contrast to all the other assessed variables. This emphasizes that as population growth rates rise, negative consequences such as congestion effects and adverse dependency effects. Human capital has a significant positive impact on economic growth in Malaysia and Singapore, suggesting that education, specifically primary school education, drives economic growth by encouraging knowledge, technology, R and D and innovation spillovers as well as accelerating technology diffusion and assimilation in an economy, thereby enhancing productivity. This is consistent with the MRW model (Mankiw et al., 1992), the human capital growth model (Lucas, 1988) and Romer's endogenous growth model (Romer, 1990). Finally, trade openness has portrayed an unexpected finding as it is only inferred to be statistically significant in Malaysia, whereby there is a significant positive relationship with economic growth. This finding offers that trade liberalization provides countries with access to a broader pool of global human capital, technology, knowledge and innovations, which is ultimately translated into enhanced productivity and economic growth. The said results of this research imply that governments and policymakers should direct their focus and efforts into formulating and articulating effective strategies and policies to increase physical capital accumulation, controlling population growth, and enhancing human capital. Governments and policymakers can encourage investment through monetary policies by reducing interest rates, thereby the cost of borrowing, in order to increase physical capital accumulation. In order to control population growth, it is recommended that governments and policymakers eradicate poverty as more impoverished families perceive that conceiving more children would mean more opportunities for family income through employment. Additionally, population growth can also be managed via education, as educated people are more likely to understand the advantages of having a small family. With reference to improving education standards, this would control population growth and enhance human capital simultaneously in a country, thereby 'killing two birds with one stone' so to speak. Governments can elevate education standards and quality by providing financial assistance, upgrading school facilities and improving the quality of teachers in order to boost enrolment rates. To conclude the role of

education and human capital in economic growth, it would appear that a country endowed with an exceptional pool of human capital is ultimately reflected in its workforce's quality. With the rise of Industrialization 4.0, it is undeniable that education and human capital will play a significant role in helping countries achieve success in this digital transformation. However, since human capital is narrowly studied in this paper in terms of primary education only, future researchers may incorporate other aspects of human capital such as varying education levels and health indicators while investigating its impact on economic growth in order to fully capture and obtain the accurate depiction of human capital's role in economic growth.

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ZARZĄDZANIE BUDOWANIEM NARODU PRZEZ AKUMULACJĘ LUDZKIEGO KAPITAŁU: PERSPEKTYWA ASEAN

Streszczenie: Niniejszy artykuł ma na celu przeanalizowanie, w jaki sposób kraje ASEAN-5 zarządzają budowaniem narodu poprzez akumulację kapitału ludzkiego. W tym badaniu ilościowym przeanalizowano dane makroekonomiczne i dotyczące kapitału ludzkiego z 5 krajów ASEAN w latach 1970–2016. Zmiennymi niezależnymi uwzględnionymi w tym badaniu są kapitał fizyczny, wzrost liczby ludności, kapitał ludzki i otwartość handlowa. Teoretyczne ramy tego badania opierają się na endogenicznym modelu wzrostu gospodarczego w kapitale ludzkim Mankiw, Romer i Weil. Zastosowano technikę szacowania najmniejszych kwadratów, a wyniki empiryczne tego badania wskazują, że kapitał ludzki ma znaczący pozytywny wpływ na wzrost gospodarczy w Malezji i Singapurze. Stwierdzono, że kapitał fizyczny ma znaczący pozytywny wpływ na wzrost gospodarczy w Indonezji i Tajlandii. Na Filipinach, w Indonezji i Tajlandii wykazano, że wzrost liczby ludności ma znaczący negatywny wpływ na wzrost gospodarczy, podczas gdy otwartość handlowa wywodzi się z istotnego pozytywnego wpływu na wzrost gospodarczy tylko w Malezji.

Słowa kluczowe: kapitał ludzki, edukacja, wzrost gospodarczy, ASEAN-5, OLS

通过人力资本积累来管理国家建设：东盟视角

摘要：本文旨在分析东盟五国如何通过人力资本积累来管理国家建设。该定量研究分析了 1970 年至 2016 年 5 个东盟国家的宏观经济和人力资本数据。本研究中纳入的自变量是物质资本，人口增长，人力资本和贸易开放度。本研究的理论框架基于 Mankiw, Romer 和 Weil 的内生人力资本增值 Solow 经济增长模型。采用普通最小二乘估计技术，本研究的实证结果推断人力资本对马来西亚和新加坡的经济增长具有显著的积极影响。发现物质资本对印度尼西亚和泰国的经济增长产生了显著的积极影响。在菲律宾，印度尼西亚和泰国，人口增长对经济增长产生了显著的负面影响，而贸易开放被认为只对马来西亚的经济增长产生了显著的积极影响。

关键词：人力资本，教育，经济增长，ASEAN-5, OLS