Efficient Vol 6 (2) (2023): 118-134 DOI: https://doi.org/10.15294/efficient.v6i2.59541

EFFICIENT

Indonesian Journal of Development Economics

https://journal.unnes.ac.id/sju/index.php/efficient

The Impact of Human Capital and Corruption on ICOR in ASEAN Countries

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Permalink/DOI: https://doi.org/10.15294/efficient.v6i2.59541

Submitted: December 2022; Revised: March 2023; Accepted: June 2023

Abstract

This study aims to analyze the effect of the Capital-Labor Ratio, Mean Years of Schooling, Corruption Perception Index, FDI to GFCF Ratio, and Trade Openness on the Incremental Capital-Output Ratio (ICOR) as a measure of investment efficiency in 8 ASEAN countries. The results of this study indicate that Capital per Worker, Corruption Perception Index, FDI to GFCF Ratio, and Trade Openness have a significant effect on ICOR in 8 ASEAN Countries. While the Mean Years of Schooling have no significant effect on ICOR in 8 ASEAN Countries. Suggestions in this study to create investment efficiency in 8 ASEAN countries are to maintain and select the growth of Capital per worker by recognizing that increasing investment in the capital-intensive sector is a critical sector with a large spillover effect on the economy, increasing the quantity and quality of education, eradicating corruption, increasing FDI flows by increasing the country's competitiveness through the creation of a conducive business climate and providing various monetary and fiscal incentive, lowering export trade barriers, and attempting to limit and substitute imported consumptive and high-dependence products by developing and producing them domestically.

Keywords: Incremental Capital-Output Ratio, Capital per Worker, Mean Years of Schooling, Corruption Perception Index, FDI to GFCF Ratio, Trade Openness

How to Cite: Utomo, A. (2023). The Impact of Human Capital and Corruption on ICOR in ASEAN Countries. Efficient: Indonesian Journal of Development Economics, 6(2), 118-134. https://doi.org/10.15294/efficient.v6i2.59541

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INTRODUCTION

Capital formation becomes an engine of growth that is able to spur economic activity and produce higher output in a country. The main thinkers of classical economics such as Adam Smith, David Ricardo and Thomas Malthus

believe that productive investment and capital formation have a positive influence on the speed of the economic growth process (Osundina & Osundina, 2014). Through the formation of capital, various new production facilities will be available that can increase the ability to produce output and add value. So that in the future, output will increase and economic growth can be realized.

Capital formation can be interpreted as the process of collecting assets derived from the proportion of income that is currently saved or invested to increase output or income in the future (Bakare, 2011). In other words, the capital used to increase production capacity is based on funds sourced from income and savings. The higher the income in a country, the more adequate the level of savings which is a source of capital formation will be. However, the condition that generally occurs in developing and poor countries is the difficulty in providing sources of capital formation (Hasanah, 2020). People's low income in developing and poor countries can only be used to meet all their needs, while little can be channeled as savings and investment.

According to Chenery and Strout (1966), limited sources of capital formation in developing countries can be seen from the existence of the two gap problems, namely the condition where domestic savings are unable to offset investment opportunities (saving-investment gap) and the foreign exchange owned is unable to finance imports of capital and semifinished goods needed (foreign exchange gap). Bosworth & Collins (1999) argue that limited capital accumulation is the cause of low output in some developing countries. So that limited capital will further slow down the process of economic growth, which is very important for developing countries.

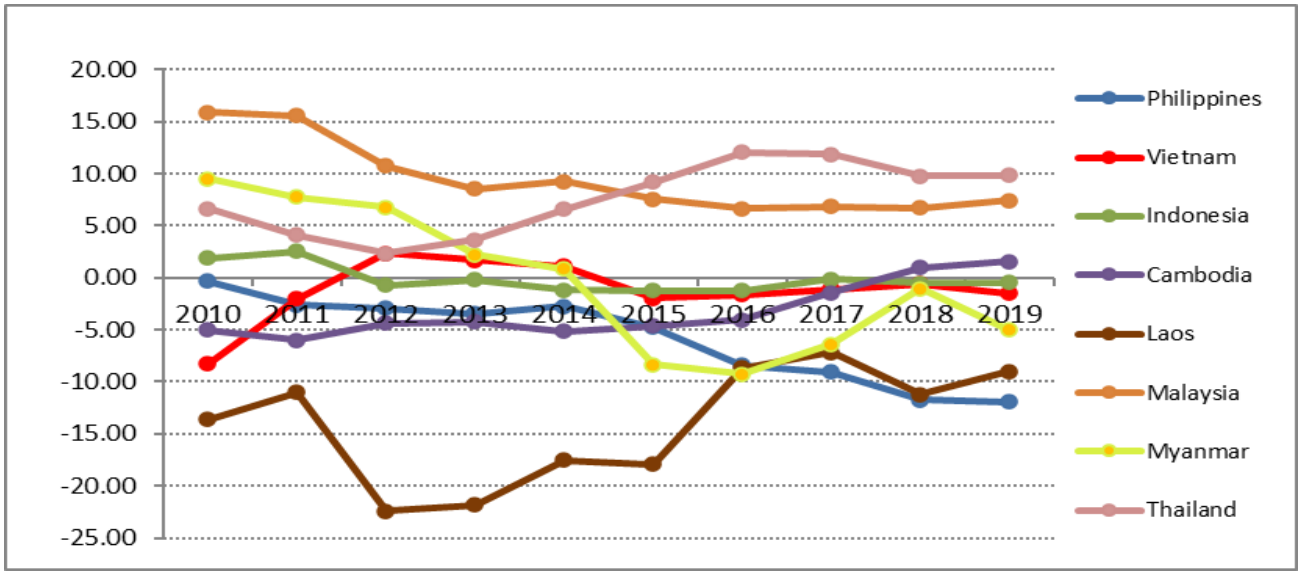

Figure 1. Saving Investment Gap in 8 ASEAN Countries (% of GDP)
Source: World Bank, 2022

The Association of Southeast Asian Nations (ASEAN) is an organization of countries in the Southeast Asia region whose majority members are developing countries and are classified as having middle income such as the Philippines, Indonesia, Cambodia, Laos, Malaysia, Myanmar,

Thailand and Vietnam. Meanwhile, Brunei Darussalam has been classified as a high-income country even though it is still a developing country and Singapore, which has become a developed country and has a high income. Based on Figure 1, 8 ASEAN countries classified as developing and middle-income countries experienced various conditions of saving-investment gap during 2010-2019. Based on Figure 1, Thailand and Malaysia each have positive savings-investment gap values, respectively, while other countries, namely Laos, Cambodia, Indonesia, the Philippines, Vietnam, and Myanmar have negative savings-investment gap values.

The positive saving-investment gap, as happened in Thailand and Malaysia, indicates a higher saving rate than the investment level. In other words, a positive saving-investment gap indicates an untapped investment potential in the domestic real sector, or commonly known as over saving or underinvestment. The excess funds from these savings can still be used to increase capital formation and economic growth in the country. Meanwhile, the negative saving-investment gap in other ASEAN developing countries such as Laos, Cambodia, the Philippines, Indonesia, Myanmar and Vietnam illustrates the low ability of domestic savings to meet the investment needs. So this has an impact on the limited availability of domestic capital in these countries.

Table 1. Current Account Surplus/Deficit Conditions in 8 ASEAN Countries (% of GDP)

Countries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Philippines	3.45	2.41	2.65	4.01	3.62	2.37	-0.38	-0.65	-2.56	-0.81
Indonesia	0.68	0.19	-2.66	-3.19	-3.09	-2.04	-1.82	-1.59	-2.94	-2.71
Cambodia	-8.73	-8.00	-8.63	-8.51	-8.64	-8.86	-8.66	-8.12	-11.78	-15.00
Laos	0.41	-2.36	-7.31	-7.84	-14.50	-15.76	-8.76	-7.48	-9.18	-5.21
Malaysia	10.06	10.90	5.19	3.47	4.39	3.01	2.37	2.81	2.24	3.37
Myanmar	3.18	-2.60	-2.10	-0.64	-3.25	-4.18	-2.64	-6.53	-2.81	0.32
Thailand	-3.37	2.54	-1.23	-2.10	2.86	6.92	10.51	9.63	5.61	7.03
Vietnam	-3.69	0.17	6.05	4.52	5.03	-1.06	0.30	-0.74	2.41	5.00

Source: World Bank, 2022

The problem of limited sources of capital formation can also be seen from the foreign exchange gap, which is known from the current account balance of a country. The current account balance is a record of a country's international transactions with other countries around the world in the form of trade in exports and imports of goods and services, investment income, and transfers (Kurniadi & Aimon, 2018:178). A positive current account balance or a surplus indicates that a country's foreign exchange is capable of financing various kinds of imports of needed capital goods. Meanwhile, a negative current account balance or a deficit indicates that a country's foreign exchange is unable to finance the import of capital goods needed. Based on table 1, Cambodia, Indonesia, Laos and Myanmar respectively experienced deficits in the current account balance, while the Philippines, Thailand and Vietnam experienced

fluctuating conditions during 2010-2019. Malaysia has a current account balance that is always positive, even though it has a downward trend. Cambodia is the country with the highest current account deficit, with an average of 9,49% of GDP. If calculated in total, the contribution of the current account balance as part of GDP in the 8 ASEAN countries experienced a downward trend and the average contribution of the current account balance to GDP decreased by 0,14% per year during 2010-2019.

Based on figure 1 and table 1, it can be concluded that most of the 8 ASEAN developing countries with middle income show a double gap condition that occurred at the same time as happened in Laos, Indonesia, Myanmar, Cambodia and the Philippines which caused limited sources of capital formation. The use of foreign capital such as foreign direct investment (FDI), foreign portfolio investment, foreign debt and grant funds are often targeted and are generally used to overcome domestic capital problems. Although on the other hand, the use of foreign funds is also at risk of causing dependence and has a negative impact on the economic stability of a country, especially in the form of external debt (Zainulbasri, 2000).

External debt is an investment financing tool that has the highest economic risk compared to other foreign funds because it is vulnerable to cause a debt trap. External debt also carries financial risk arising from movements in exchange rates, interest rates, and economic shocks that may affect the business environment. History records how Indonesia experienced an economic crisis in 1997 which began with the Thai baht exchange rate crisis, which then impacted on the depreciation of the rupiah. As a result, entrepreneurs find it difficult because they have to pay their maturing foreign debt obligations and pay for the necessary imported raw materials at very high prices (Harahap, 2013: 18). Thus, the monetary crisis resulted in an increase in the external debt burden and caused an economic crisis in Indonesia. The ratio of external debt to Indonesia's Gross National Product (GNP) at the beginning of the crisis, namely in 1997 was 65,10%, then increased very high to 168,20% in 1998.

Another very serious debt crisis is the case that hit Latin American countries in the 1980s, especially Argentina and Mexico (Kaminsky and Pereira, 1996). In addition, the term "Chinese Debt Trap" has recently emerged, which is a new model from China to gain power under the pretext of providing infrastructure assistance and loans to developing countries as members of the Belt And Road Initiative (BRI). China can take over the infrastructure projects it finances if the BRI country fails to repay the loan. As has happened, the ports of Sri Lanka and Pakistan have been taken over by China for 99 years because these countries failed to repay their loans (Priangani et al., 2021).

The capital management strategy is a key factor for a country in facing the dynamics of the economy, which is full of challenges. In the process of economic development, efficiency in the allocation of existing economic resources is a matter that needs to be considered so that economic growth can provide optimal results and avoid waste (Arsyad, 2010). In addition, the competitiveness of a country will also increase in line with the increase in productivity and efficiency of its economic resources. Investors will prefer countries with a much higher level of investment efficiency than other countries with a much lower efficiency level to save costs and obtain maximum profits (Dunning & Lundan, 2008).

Efficiency in production can be defined as a comparison between output and input, or the amount of output produced from one input used (Susantun, 2000). If the ratio of output to input is greater, then the efficiency is said to be higher. Likewise, if the ratio of output to input is smaller, then the efficiency is said to be lower. Regarding investment, the Incremental Capital-Output Ratio (ICOR) is one of the calculation indicators that can generally be used to measure the level of investment efficiency in a country or region (Soumaila, 2017). ICOR is a quantity that shows the relationship between the amount of increase in output (ΔY) resulting from a certain increase in the capital stock (ΔK), or it can also be described as ΔK/ΔY (Jhingan, 2014). The lower the ICOR value, the higher the efficient level of investment. Conversely, the higher the ICOR value, the lower the level of investment efficiency in a country or region.

The ICOR value in developing countries is ideally expected to be around 3 (Soumaila, 2017). Widodo (1990) in Imelda (2015) also argues that good investment productivity is indicated by ICOR values ranging from 3 to 4. Relatively cheap, while sources of capital formation are quite limited due to low income and savings. So that the economic sector in developing countries with a surplus of labor will be more labor-intensive with a high labor intensity. In such circumstances, any additional capital stock will produce greater output than in developed countries, which are more dominated by capital intensive production patterns (Arsyad, 2010). So the ICOR value will tend to be of small value.

Table 2. ICOR Value in 8 ASEAN Countries (in USD)

Countries	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Mean
Philippines	2.71	5.16	3.02	2.99	3.45	3.84	4.03	4.25	4.81	4.86	3.91
Indonesia	5.36	5.54	5.82	6.26	6.87	7.06	6.81	6.84	6.80	6.95	6.43
Cambodia	2.98	2.63	2.79	2.95	3.14	3.26	3.43	3.27	3.09	3.37	3.09
Laos	3.31	3.64	4.42	4.04	4.37	4.66	4.81	4.71	5.18	6.91	4.61
Malaysia	3.26	4.53	4.95	5.92	4.63	5.34	5.96	4.69	5.44	5.48	5.02
Myanmar	2.50	5.55	4.41	4.09	4.29	5.29	5.97	5.22	5.82	6.01	4.92
Thailand	3.46	30.19	3.84	9.56	24.86	8.07	7.52	6.18	6.00	10.25	10.99
Vietnam	4.61	4.11	4.69	4.54	4.26	3.94	4.36	4.13	4.43	4.50	4.36

Source: UNCTAD, 2022

Table 2 shows the ICOR value in 8 ASEAN developing countries with middle income resulting in an increasing trend and the majority have a value above 4 which illustrates less than ideal investment efficiency in these countries. Thailand is the most inefficient, with a Mean ICOR value of 10.99 during 2010-2019. Then followed by Indonesia with a mean of 6.43, Malaysia of 5.02 and Myanmar of 4.92. Of the 8 countries, only Cambodia and the Philippines have a Mean ICOR value during 2010-2019 below the number 4 which is 3.09 and 3.91, respectively, which illustrates the Mean investment runs efficiently. However, ICOR in the two countries also experiences an increasing trend or towards a lower level of efficiency every year.

Capital per Worker is a measure of the comparison of the use of capital to the use of labor in the production process. In other words, Capital per Worker explains how much capital is distributed to each worker in a production process (Pancawati, 2000). Capital per Worker is also closely related to the productivity of capital and worker. With the increase in capital goods in the form of machinery, equipment, buildings, vehicles, technology and so on, workers can produce greater output at the same time, assuming the growth of worker is lower than the growth of capital. However, when Capital per Worker increases, capital deepening occurs, which means that the distribution of capital among each worker becomes larger, and the production process leads to a capital-intensive approach. So the increase in Capital per Worker will cause a decrease in investment efficiency.

Another determinant of investment efficiency is the quality of human resources (Soumaila, 2017). The quality of human resources can be a benchmark for good or bad managerial quality (Purwanto & Utami, 2023). Superior human resources through a good level of education are expected to be able to utilize and develop technology to utilize the resources owned by a country. So that the results will provide welfare for the community (Tyas & Ikhsani, 2015). The use of capital equipment and productive resources will be optimally utilized in countries with good levels of education. So that the output obtained will be greater with the existing capital.

The Mean Year of Schooling can be an illustration of the average length of time people in a country take education. The greater the average length of schooling, it is expected that human resources will be more educated and qualified. Thus, an increase in the education level of a country will be able to generate efficient investment due to better capital management.

Investment efficiency can also be affected by the level of corruption in a country (Soumaila, 2017; Swaleheen, 2007; Lambsdorff, 2003). Corruption is an act against the law by abusing the rights of other parties for profit. Corruption can lead to market integrity and weak implementation of good governance in both the private and public sectors (Islamiyah, 2019). Khan and Jomo (2000) state that the practice of rent seeking is a collaborative activity between entrepreneurs and the government to seek profit and enrich themselves by looking for loopholes in public policies or budget allocations in government projects, leading to high corruption and causing development. Economy is becoming a high-cost economy in Asia. Damanhuri (2010) in Hariyani et al. (2016) also argues that corruption will cause a high-cost economy and hinder the process of economic growth through obstacles that occur in investment. Thus, it is estimated that the more corrupt a country is, the more inefficient the investment in that country will be.

The Corruption Perception Index (CPI) is an index that measures the level of corruption in a country, whose assessment is published by an institution called Transparency International. Specifically, the CPI measures the level of corruption in a country based on the amount of abuse of power for personal gain among government agencies and the integrity of people who have authority in a country. The CPI score ranges from 0 to 100 where the higher the CPI value, the lower the level of corruption in those countries and vice versa if the CPI value is lower or close to zero, the more corrupt the country is.

The type of investment chosen is very influential on the reciprocal results obtained.

Private sector investment is believed to be more productive than public sector investment because it has an incentive to generate profits and increase income (Hafriandi & Gunawan, 2018). So that the higher the composition of private investment types will have a positive effect on investment efficiency.

Foreign Direct Investment (FDI) is one of the private investments whose financing comes from foreign funds. Neoclassical growth theory argues that FDI is able to increase economic growth through its role in channeling funds to productive economic sectors that lack capital (Purnomo & Mudakir, 2019). According to Sarwedi (2002), some observers agree that capital sourced from FDI is the most potential source of foreign financing compared to other sources. According to Borensztein et al. (1998), FDI is an important means of technology transfer and has a greater contribution to the economic growth of a country than domestic investment. Therefore, the larger the FDI ratio in the total Gross Fixed Capital Formation (GFCF), it is expected that investment productivity will be even greater.

Openness in foreign trade (Trade Openness) has positive benefits for the economy of a country, especially in providing new investment opportunities and strengthening relations between the domestic market and international markets. Trade openness means that trade barriers in a country to market goods and services will gradually decrease and disappear (Hoang, 2012). Saidi & Hammami (2018) state that high Trade Openness in a country is a good indicator of the ease of doing business and represents the simplicity of procedures in carrying out export and import operations for a company. So that investors will benefit from the comparative advantages of these countries, namely by exporting to international markets and importing production inputs that are cheaper from other countries.

Trade Openness is described by the ratio between trade, namely exports plus imports to GDP in a country (Sarkar, 2008). The higher the ratio, the more open foreign trade in the country is. Likewise, if the ratio is low, then foreign trade in the country will be closed. In terms of investment efficiency, high trade openness will provide greater returns for each invested capital because the barriers to trade are decreasing. So that the market share will be wider and the additional costs that must be incurred to market an item will decrease and affect the increase in investment efficiency.

Based on this description, several developing countries in ASEAN still recorded less than ideal investment efficiency. Efficient investment is very important, especially for developing countries who want to create a high level of economic growth so that the level of people's welfare immediately increases. This is also supported by the problem of limited sources of capital formation and high dependence on foreign capital, especially in the form of external debt, which can threaten economic stability at any time. Therefore, further research is needed to find out how much influence Capital per Worker, Mean Year of Schooling, Corruption Perception Index, FDI to GFCF Ratio and Trade Openness have on ICOR as a measure of investment efficiency in 8 ASEAN developing countries, namely the Philippines, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Thailand and Vietnam.

RESEARCH METHODS

This research uses quantitative research. According to Sugiyono (2013), quantitative research is a research method that has the full intention of testing the established hypothesis.

This research uses secondary data type with data collection technique is documentation. The variable data used in this study were obtained from data sources originating from various reports and statistical documents that have been published and can be accessed on the official websites of relevant international institutions such as the United Nations Conference on Trade and Development (UNCTAD), the International Labor Organization (ILO), United Nations Development Program (UNDP), World Bank, and Transparency International (TI).

The data analysis technique in this study used panel data regression with the help of Eviews 9.0 software. This study uses a time series for 10 years from 2010-2019 and a cross-section of 8 ASEAN countries. In this study, ICOR is the dependent variable while the independent variables used are 5, namely (1) Capital per Worker, (2) Mean Year of Schooling, (3) Corruption Perception Index (CPI), (4) FDI Ratio in the GFCF, and (5) Trade Openness.

$$ICOR_{it} = \beta_o + \beta_1 MPT_{it} + \beta_2 RLS_{it} + \beta_3 CPI_{it} + \beta_4 RFP_{it} + \beta_5 TO_{it} + \varepsilon_{it}$$

Where ICOR is Incremental Capital-Output Ratio, β0 is constant, β1- β5 is coefficient, MPT is capital per worker, RLS is mean year of schooling, CPI is corruption perception index, RFP is FDI to GFCF ratio, TO is trade openess, ε is error term, i is cross-section data (8 ASEAN Countries), t is time-series data (2010-2019).

RESULTS AND DISCUSSION

In this study, the independent variables experienced multicollinearity problems, namely the existence of a high or perfect correlation between each independent variable. The existence of multicollinearity problems in Independent Variables will cause the model to have large variances and covariance, large determinant coefficient R^2 (R-square) but statistically many variables are not significant, and standard errors that are sensitive to small changes in the data (Gujarati & Poter, 2009). Therefore, multicollinearity healing technique using data transformation method was chosen in this study. Data transformation is a fully intentional effort to make the scale of the original data measurement change to another, simpler form. So that the observation data in the study can meet the assumptions that underlie the variance. According to Gujarati and Poter (2009), the transformation chosen to treat multicollinearity is first difference or delta. Then this research model becomes as follows:

$$DICOR_{it} = \beta_o + \beta_1 DMPT_{it} + \beta_2 DRLS_{it} + \beta_3 DCPI_{it} + \beta_4 DRFP_{it} + \beta_5 DTO_{it} + \varepsilon_{it}$$

Where DICOR is incremental capital output ratio of first different, β0 is constant, β1-β5 is coefficient, DMPT is capital per worker in the form of first different, DRLS is mean year of schooling in the form of first different, DCPI is corruption perception index in the form of first different, DRFP is FDI to GFCF ratio in the form of first different, DTO is is trade openess in the form of first different, ε is error term in the form of first different (ε_{it}- ε_{it-1}), i is cross-section data (8 ASEAN Countries), t is time-series data (2010-2019).

After carrying out various stages to get the best model for panel data regression, it was found that the Common Effect Model with the Generalized Least Square (GLS) method and the cross-section Seemingly Unrelated Regression (SUR) was the best model. CEM by weighing the covariance coefficient of cross-section SUR is

more efficient than the OLS method for estimating data with autoclave residuals (Iswati et al., 2014).

Table 3. Estimation Result of Common Effect Model with GLS Method and Cross-Section SUR

Variable	Coefisient	Std.Error	t-Statistic	Prob.
C	0.727386	0.154341	4.712862	0.0000
DMPT	-0.005798	0.001148	-5.049849	0.0000
DRLS	-0.305466	0.793224	-0.385094	0.7014
DCPI	-0.208243	0.043516	-4.785430	0.0000
DRFP	-0.151771	0.016113	-9.419443	0.0000
DTO	0.067491	0.020240	3.334511	0.0014

Source: Data Processed, 2022

Table 3 shows the estimation results used in this study are the Common Effect Model with the Generalized Least Square (GLS) method and the cross-section Seemingly Unrelated Regression (SUR). The regression coefficient values for each research variable are as follows:

$$DICOR = 0.727386 - 0.005798(DMPT) - 0.305466(DRLS) - 0.208243(DCPI) - 0.151771(DRFP) - 0.067491(DTO) + \varepsilon_{it}$$

Capital per Worker partially has a negative and significant effect on ICOR in 8 ASEAN Countries during 2010-2019. The regression coefficient value of the Capital per Employee variable is -0.005798. This Value can be interpreted that every time there is an increase in Capital per Worker in 8 ASEAN Countries in a certain year with the previous year amounting to 1 US$ per Worker, the ICOR value in 8 ASEAN Countries in that year will experience an increase change from the previous year of 0.005798 assuming ceteris paribus.

The results of this study are not in line with the neoclassical growth production function model, which states that capital and labour as production inputs have a substitution relationship or replace each other to produce certain outputs (Arsyad, 2010). So, even though the increase in Capital per Worker which illustrates that the use of capital in production inputs is getting bigger than the use of Labor inputs, it is not able to ensure that investment efficiency will be lowed. So, in the results of this study, each addition of capital stock actually produces greater output or has increased investment efficiency. Thus, the ratio of the use of capital or labor in producing an output is not in accordance with what is expected in the theory of the neoclassical production function model, especially in the 8 ASEAN countries.

The results of this study differ from the findings of Lambsdorff (2003). In this study, Capital per Capita is used as a proxy that illustrates the use of capital rather than the use of human labor. Meanwhile, capital productivity which is represented by Capital per GDP is used as the dependent variable. The results of the study stated that Capital per Capita had a negative and significant effect on capital productivity in 69 countries. The greater the Capital per Capita in a country, the lower the productivity of capital in that country. So that the decline in capital productivity will ultimately affect the efficiency of capital itself.

The results of this study are in line with research by Soumaila (2017), Mahmud (2008), Swaleheen (2007), Wai (1985), and Vanek and Studenmund (1968) which explain why increasing the number of certain production inputs does not always result in decreasing efficiency. In these studies, it was found that the relationship between changes in production input prices in the form of interest rates and wages of workers is ambiguous and less

convincing to affect investment efficiency. The amount of capital per worker can be influenced by the availability of production input resources owned and the price of each of these production inputs, such as interest rates and worker wages. The interest rate is the price required for each investment, while the Employee wage is the price required for each Worker. However, in these studies, the relationship between the number of inputs proxies indirectly through input prices does not produce definite results in influencing ICOR or investment efficiency.

Mean Year of Schooling partially has a negative but not statistically significant effect on ICOR in 8 ASEAN countries during 2010-2019. In other words, the effect of Mean Year of School on ICOR produces the same direction as expected but is not statistically significant. So, it cannot be directly ascertained that the Mean Year of School is able to affect investment efficiency in 8 ASEAN countries during 2010-2019.

The non-significance of the Mean Year of Schooling variable, possibly due to the growth in education levels in the 8 ASEAN countries that have not experienced significant growth or high levels of education, especially for Workers, which is seen from the higher Mean Year of Schooling which is unable to show the actual quality of education. This can occur due to other problems, such as mismatch of skills and jobs. The mismatch of jobs and skills can be in the form of under education or over education. Under education is a condition where the education of workers who work in certain business fields or types of work is lower than the educational mean required in certain business fields or types of work (Saputra & Junaidi, 2011). While over education is a condition where a job actually only requires workers with low education, but is filled by workers who have higher education and skills (Saputra & Junaidi, 2011). This means that companies do not fully utilize the productive capacity of their workers (Sparreboom & Tarvid, 2016).

Kampelmann & Rycx (2012) and Grunau (2014), both studies report that under education workers interfere with company-level productivity, but in the case of over education a significant positive impact is found on productivity. Based on research by Velciu (2017), in the short term over education can have a positive impact on productivity for a company, but in the long term, mismatched workers will affect a decrease in job satisfaction and lower wages. Moreover, at the macroeconomic level, job mismatch means a potential loss of human resources and capital, which can have a negative effect on overall productivity. In the research of Tsang (1987), found that over education has a negative impact on job satisfaction. Meanwhile, job satisfaction has a positive and significant correlation with output. So, it can be concluded that excess education has a negative impact on worker productivity.

CPI has a negative and significant effect on ICOR in 8 ASEAN countries during 2010-2019. The coefficient value of the CPI variable is -0.208243. This Value can be interpreted that every time there is a change in the increase in CPI in 8 ASEAN countries in a given year with the previous year being 1 point, the ICOR value in 8 ASEAN countries in that year will decrease from the previous year of 0.208243 with the assumption of ceteris paribus.

The negative effect of CPI on ICOR generated in this study is in accordance with Schumpeter's theory, which explains that high government intervention in the economy can cause a slowdown in the process of economic growth, especially if this occurs in developing

countries. The high level of government intervention will hinder the development of the private sector, which is rich in innovation, and limit their freedom in entrepreneurship.

The increasing level of corruption also shows that the performance of government institutions and agencies that act as a counterweight when there is a market failure is getting worse. Based on institutional economic theory, institutions or institutions have a very vital role in determining the economic progress of a nation (Arsyad, 2010). So with a bad institutional condition, a slow economic rate will be obtained because of the large obstacles that are obtained. Thus, high levels of corruption provide a disincentive to entrepreneurship and productivity. So that corruption will further exacerbate the occurrence of market failures, which in turn have an impact on low investment efficiency.

This study is in accordance with the results of research by Soumaila (2017), Swaleheen (2007), and Lambsdorff (2003). Where the three conducted research on the effect of corruption on ICOR. The three studies yield the same conclusion that corruption has a negative and significant effect on investment efficiency. Soumaila (2017) chose corruption to measure the impact of institutional quality on investment efficiency. Soumaila's research (2017) uses the corruption index issued by the International Country Risk Guide (ICRG) as a variable that represents the level of corruption in a country. According to him, corruption can affect investment efficiency in both private and public sector investments. Meanwhile, in Swaleheen's (2007) research, corruption has a negative impact not only on investment efficiency but also on investment choices. This effect is more pronounced in developing countries where corruption is high. Meanwhile, in Lambsdorff's research (2003), corruption as proxies by CPI has a positive impact on capital productivity.

The FDI to GFCF Ratio partially has a negative and significant effect on ICOR in 8 ASEAN countries during 2010-2019. The regression coefficient value of the FDI to GFCF Ratio is -0.151771. This value can be interpreted that every time there is a change in the increase in the FDI Ratio in GFCF in 8 ASEAN Countries in a certain year with the previous year being 1%, the ICOR value in 8 ASEAN Countries in that year will decrease from the previous year of 0.151771 with the assumption ceteris paribus.

The results of this study are in accordance with Schumpeter's growth theory that the capitalist system applied in developing countries can accelerate economic development in these countries. The capitalist system emphasizes that the role of the private sector in the economy will have a positive impact on the emergence of innovation, economic development and increasing public output. So that the large role of the private sector and the low level of government intervention in the economy will facilitate the creation of new entrepreneurs who bring innovation to the business world. The emergence of new innovations is expected that every process and economic activity becomes fast, efficient and generates greater profits. So that the process of economic growth and development will run well.

The results of this study are also supported by research from Jayaraman and Ward (2004) which in their study concluded that the ratio of private investment which is relatively larger than public investment has a positive effect on investment efficiency in Fiji. This result explains that a larger share of private investment in total investment will result in greater incentives than

if total investment is supported by more public investment. It is known that private investment has a greater incentive to generate profits than public investment (Hafriandi & Gunawan, 2018). Then the pursuit of this profit will lead to a more efficient use of capital resources.

In the research of Khan and Reinhart (1990:25), private investment is believed to have a productivity advantage over public investment. In his research, it was found that in the long run, private investment has a greater marginal productivity than public investment in developing countries. While the research by Abdaljawwad and Sarmidi (2018), also agrees that private investment has a positive effect on economic growth. Karim et al. (2005), Haque (2012), and Rahman et al. (2016) conclude in their respective studies that private investment has a much larger and important role in the process of economic growth in Bangladesh. Meanwhile, Makuyana and Odhiambo (2017) found that private investment contributed more to economic growth than public investment in Malawi. The advantages of private investment over public investment in the process of economic growth are also reported in the research of Ghura (1997) in Cameroon, Beddies (1999) in Gambia, and Zou (2006) in Japan and United States.

The results of this study are also in accordance with the neoclassical growth theory, which believes that FDI is able to increase economic growth through its role in channeling funds to productive economic sectors that lack capital (Purnomo & Mudakir, 2019). So that with the new source of capital funds, the productive sectors that previously had stopped or grew slowly due to lack of capital were able to revive and grow more rapidly. In addition, the flow of FDI that enters a country also allows for cooperation between foreign investors and existing local companies or industries, especially to meet the basic input needs required by new multinational companies that arise as a result of FDI. So indirectly, through the existing cooperation, it will affect the demand for capital goods, semifinished goods, raw materials and other inputs that trigger economic growth in FDI destination countries.

Another potential benefit is the emergence of new technologies, capital equipment and manufacturing expertise which are carried away by the flow of FDI into a country. FDI that enters a country will transfer technology to local investors through knowledge sharing in new innovations in production, research, development, and also lead to increased competition in trade which results in industrial efficiency and effectiveness (Osano & Koine, 2015:1). So that the transfer of skills, technology, managerial expertise and governance practices acquired within a certain time will help create productive and efficient management of capital resources.

Trade Openness partially has a positive and significant effect on ICOR in 8 ASEAN countries during 2010-2019. The regression coefficient value of the Trade Openness variable is 0.067491. This value can be interpreted that every time there is an increase in Trade Openness in 8 ASEAN countries in a given year with the previous year being 1%, the ICOR value in 8 ASEAN countries in that year will increase from the previous year of 0.067491% with the assumption of ceteris paribus.

The results of this study are not in line with the theory of economies of scale, which states that increasing the company's production scale will reduce the mean cost of production and generate profits (Subardin et al., 2018). Through

increased Trade Openness, business actors should benefit from the convenience of expanding or expanding market share due to an increase in economic cooperation on a larger scale. Firms can also take advantage of economies of scale and scope that represent reduced firm costs due to increased production scale (Zenger, 1994; Becker-Blease et al., 2010; Leal-Rodríguez et al., 2015; Ambrose et al., 2019). However, this is not the case in 8 ASEAN countries and the opposite is true.

The results of this study are the same as those found in Lambsdorff's (2003) study that Trade Openness has a negative effect on capital productivity. According to Lambsdorff (2003), different results from the theory occur because the high Trade Openness in a country can have an impact on the amount of foreign capital that enters the country. So that the stock of capital owned will be greater and affect the lower productivity of capital. Lambsdorff (2003) also states that Trade Openness is wrong in describing a more competitive market because the Trade Openness of a country decreases with its size, for example with the population it has. The larger the population of a country, the more trade is carried out for the domestic market and not with foreign countries.

Increasing trade openness in a country must be accompanied by an increase in the quality of good human resources so that its function to absorb technological advances from trade liberalization can run well. According to research by Grossman and Helpman (1991), the positive effect of Trade Openness on economic growth can occur depending on the abundance of international knowledge. It is also supported by Grossman and Helpman (1991), Lee (1995), and Mazumdar (2001) that imports are an important channel for the transfer of knowledge and advanced technology that triggers increased productivity and competition in the domestic economy.

Another reason why the results of this study are different from the theory is because the trade openings in the 8 ASEAN countries are mostly contributed by high imports rather than exports. So that if the goods imported are consumptive and non-productive goods, then Trade Openness will not have a good impact on economic growth and investment efficiency.

Based on the results of research by Vanek and Studenmund (1968), the import ratio in GNP has a positive and significant effect on ICOR or a negative and significant effect on investment efficiency in underdeveloped and developed countries. While in Swaleheen's research (2007), the effect of the import ratio in GDP can be different depending on the characteristics of a country. In the study it was found that the ratio of imports in GDP has a negative effect on investment efficiency in countries with high levels of corruption, middle income and high income. While the positive influence is experienced by countries with low levels of corruption and low income. These results show that good quality institutions are able to provide good import policies and countries with low incomes tend to require large capital for their economic development, so that large imports can increase investment efficiency.

CONCLUSION

Based on the description that has been disclosed in the discussion, several conclusions can be drawn, namely: 1) Capital per Worker have a negative and significant effect on ICOR. 2) Mean Year of School have a negative but not significant effect on ICOR. 3) CPI have a negative and significant effect on ICOR. 4) FDI to GFCF

Ratio have a negative and significant effect on ICOR. 5) Trade Openness have a positive and significant effect on ICOR.

Suggestions that can be put forward in this study to create investment efficiency in 8 ASEAN countries, namely controlling and maintaining capital growth per worker by choosing a capital-intensive business sector that is productive. Governments in 8 ASEAN countries need to enforce a strong selection and consideration of new investments that enter the capital-intensive sector by considering that the sector is a vital sector that has a large spillover effect on the economy given the limited sources of capital formation and the high potential of workers. Given that there is still the possibility of the law of diminishing returns on each production input, it is also necessary to maintain a balance in the growth of production inputs, both capital and labor, and to improve the quality of each of these production inputs.

Even though statistically Mean Year of School has no significant effect on ICOR. However, the 8 ASEAN countries still have to increase the level of education by providing easy access to education that is carried out evenly in various regions and groups of people. In addition, 8 ASEAN countries also need to improve the quality of education through increased investment in education, both by the government and the private sector, especially in professional education that is oriented to the world of work such as vocational and vocational education. In addition, there is a need to harmonize the educational curriculum with the needs of the labor market. So that unemployment, job mismatches, and weak technology diffusion processes that may occur can be avoided and facilitate the process of investment efficiency.

Since the CPI have a negative and significant effect on ICOR, efforts that need to be made are efforts that lead to corruption eradication activities, such as the creation of various policies and legal instruments aimed at eradicating and reducing the level of corruption. In addition, reform of the bureaucratic system that measures performance based on performance targets and achievements, simplification of procedures, and bureaucratic transparency is needed so that the potential for corruption can be reduced.

Encouraging an increase in the flow of FDI into the 8 ASEAN countries, such as increasing promotion and competitiveness through monetary and fiscal incentives as well as creating investment policies that are more transparent, attractive, and competitive. In addition, there is a need for regulations to select FDI flows into economic sectors that are tailored to the needs and potential of the resources they have, require technology transfer for multinational companies or provide license agreements so that multinational companies are willing to transfer technology, and improve supervision and protection for business actors to avoid monopolistic practices in the domestic market in line with the entry of multinational companies.

Related to the Trade Openness variable, it is necessary to increase exports and maintain or limit imports only to imports of capital materials that are productive in nature and seek to substitute imported products that are consumptive and have a high dependence by developing and producing them domestically. Increasing exports can be done by reducing barriers in the form of tariffs, quota restrictions, and licensing that are difficult for export-oriented companies and industries, as well as increasing promotion and support to business sectors that

have the potential in the form of comparative and competitive advantages to be able to compete in the international market.

In addition, it is necessary to increase the absorption capacity of technology both in physical infrastructure and human resources. The government also needs to diversify export and import partner countries to avoid dependence and spillover effects that can cause disruption to the domestic economy when export and import partner countries experience a crisis by increasing international cooperation both bilaterally, regionally and multilaterally to expand market reach.

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