RJME Revenue Journal: Management and Entrepreneurship

Revenue Journal: Management and Entrepreneurship, vol. 2(2), pp. 29–35, 2024
Received 9 June 2024 / published 4 July 2024
https://doi.org/10.61650/rjme.v2i2.564

The Influence of Digital Technology On Economic Growth In 8 Countries In ASEAN

Diana Berliyani[1*], Dedy Yuliawan[1], Toto Gunarto[1]

[1]Universitas Lampung, Indonesia
[*]Corresponding author: dianaberlian5@gmail.com

KEYWORDS
Economic growth;
Individual Internet usage;
Foreign direct investment;
Average years of schooling

ABSTRACT This study explores the impact of individual internet usage, foreign direct investment, and average schooling years on the ASEAN region's economic growth during 2014-2020. The panel regression analysis method was employed to analyze secondary data obtained from the World Bank and UNDP. The results of the fixed-effects regression model indicate that the variables of individual internet usage (IUI) and foreign direct investment (FDI) have a positive and significant impact on economic growth. In contrast, the average years of schooling (MYS) do not have a significant impact. These findings are consistent with previous research findings indicating that internet usage and foreign direct investment significantly contribute to economic growth in the region. However, the average years of schooling do not significantly influence economic growth in this study's context. The study shows that internet usage and foreign direct investment have a significantly positive impact on economic growth in ASEAN, while the average years of schooling do not have a significant effect. These findings imply that ASEAN economic development policies should focus on enhancing technology infrastructure and investment environments and reevaluating the education system.

© The Author(s) 2024

1. INTRODUCTION

As a process of production growth, economic growth is one of the primary measures of a country's development success. Many factors, such as education, human capital, production, and technology, influence economic growth. According to Solow and Swan, economic growth depends on increasing the supply of production factors: capital accumulation, labor, population, and technological progress. Adam Smith's theory of economic growth, Budiono (2000) states that production growth includes an increase in population or human resources, capital accumulation, specialization, and division of labor. This includes increasing domestic and international trade as well as market expansion. As stated by Michael P. Todaro and Stephen C. (Todaro, 2006), investment that can improve the quality of capital resources or human and material resources so that it has an impact on increasing the number of products produced is called economic growth.

According to the new economic model, technology is an endogenous factor of economic growth. This is to the research

results. According to the new economic model, technology is an internal component of economic growth. This is based on research findings (Habibi & Zabardast, 2020), which compare the influence of digitalization and education on economic growth in Middle Eastern and OECD countries. This study was conducted over 18 years, from 2000 to 2017. The results show that technology positively impacts the economic growth of Middle Eastern and OECD countries but has a minor impact on Internet users in the Middle East.

ASEAN is the best market for digital economic growth. It is possible to say that the number of Internet users continues to grow. The number of smartphone users in ASEAN in 2014 reached more than 70% of the total population, which showed the most significant increase from 2013 to 2014. Overall, Malaysia had the highest share in 2019 at 84.19%, followed by Thailand at 66.65%, Indonesia at 47.69%, and the Philippines at 43.03% (World Bank, 2022).

Due to the rapid development in ASEAN, investors will be very interested in investing in the digital economy and Industry 4.0 businesses in 2021. Direct investment from foreign investors in this sector is expected to increase gradually. According to Solow's theory, a country can do many things to encourage economic growth. According to Solow, capital development is the engine of economic growth, and higher capital accumulation increases economic growth. Arostow explained that investment is one of the essential requirements when entering the startup world. This is to Harrod Dormer's investment theory, which emphasizes the role of investment in driving economic growth because economic output increases through increasing income and income (Jhingan, 2016).

However, the Human Development Index (HDI) is another factor that supports and correlates with foreign investment and economic growth. The HDI value of a country shows that the country is better off, according to (Subandi, 2016), the elements that influence the economic growth of a country or society, including capital accumulation, which includes all new investments in the form of land, physical equipment and human resources (man). Investing in IPM is primarily in environmental conditions to create good and effective habits.

Singapore has the highest HDI, with a score of 0.95 in 2022, according to data released by the National Development Program (UNDP, 2022). Brunei Darussalam and Malaysia have higher HDI scores than other ASEAN countries, 0.82 and 0.81, respectively. The annual HDI value in East Timor is the lowest, with 0.57, while the HDI value in Indonesia is 0.71.

A study of how information and communications technology contributes to economic development in 35 Asian countries classified the countries into lower-middle-income, upper-middle-income, and high-income groups based on income. The study results show that information and communication technology has made a significant contribution to the economic development of these countries, with different impacts at various levels of the economy, among the three highest levels. This research forms the basis of the present study, which aims to verify previous research's validity and further develop those findings.

Not many studies or research papers examine the Human Development Index (HDI) using the average years of schooling as an indicator. However, many exciting results exist from previous research and statistical data analysis. This research was conducted in the ASEAN region for seven years, from 2014 to 2020. This research aims to discover and analyze how Individual Internet Users, Average Years of Schooling, and Foreign Direct Investment Influence Economic Growth in the region.

2. LITERATURE REVIEW

Technology

Engineering is a process that produces added value. In this process, the resulting product is used or made, becoming an integral part of the system because it cannot be separated from other products (Miarso, 2007). Over the past thirty years, the rapid growth of information and communication technology worldwide has attracted many economists and researchers to study how the diffusion of information and communication technology impacts the economic growth of developed and developing countries. In the literature

(Yousefi, 2011), it has been found that information and communication technology (ICT) plays a vital role in improving economic prosperity in both developed and developing countries. Technological progress drives economic growth by increasing demand for advanced products such as software, communications equipment, and computers and increasing productivity and investment in information and communications technology.

Foreign Direct Investment

Investment is "expenditure for the acquisition of capital goods and production equipment, which aims to replace and especially complement the economy's capital goods, which will be used in the production of capital goods and production services" in economic theory. Webster (1999) said capital investment is used to get results and added value.

Budiono (2000) explains investment as costs incurred by the industrial (private) sector to purchase goods and services, increase stock of used goods, or increase factory capacity. Dornbusch and Fischer say that investment is the demand for goods and services to increase production capacity or income in the future.

According to Todaro (2006), one of the general conditions for developing a country's economy is capital accumulation, which includes land, physical equipment, new human resources, and population growth through increased labor and skills—subsequent technological advances. Capital accumulation is successful when some or all of the disposable income is saved and invested in better products (production) and future income.

According to the endogenous growth model, the return on invested capital is proportional to the country's GDP. Investments in private and government capital and human resources are thought to increase productivity, offset scientific trends that reduce production, and create externalities or positive externalities. Although technology is recognized as having a significant role, it is not necessarily the primary focus when endogenous growth models explain the process.

Economic Growth

Kuznet (1973) describes a country's economic growth as an increase in the population's capacity to provide various economic goods in the long term. This increase in power is very dependent on technological advances, organizational changes, and ideologies adapted to circumstances. An increase in the economy's ability to produce goods and services is called economic growth, according to Muana Nanga (Muana Nanga, 2005). In other words, quantitative changes are produced by economic growth, which is usually measured by GDP or industrial income per capita.

The previous definition has three components: the production process per person. The economy is not a complete picture of economic development or change at a specific time; economic growth is a "process". Economic growth is an increase in per capita or total output divided by population. Therefore, the only way to analyze production growth per population is to analyze total production on the one hand and population on the other. Unlike economic growth, economic growth is a long-term forecast in which output per capita increases for one to two years before falling. There is no need for a long-term process to increase per capita production.

Average Years of Schooling

The highest level of education people in an area can achieve is shown by the average length of education. Higher levels indicate the level of training completed. A common hypothesis is that how a person thinks and behaves is proportional to their level of education. According to Tobing (Atmanti, 2005), people with a higher level of education, which is calculated based on years of schooling, have better jobs and wages than people with a lower level of education.

According to UNDP standards, the average number of years of education is spent by people aged fifteen years and over who receive various types of education. The upper limit is fifteen years, and the lower is one year. The maximum age of fifteen indicates that the highest level of education is equivalent to upper secondary education (SMA).

3. RESEARCH METHODOLOGY

This research uses quantitative methods, time series data relapse investigations, supporting data from the Ministry of Energy and Mineral Resources (MEMR) 1990-2021, Central Bureau of Statistics (BPS) data, and World Development Indicator data. This exploratory study includes an evaluation of the significance of the independent variables (Electricity Consumption, FDI, Unemployment) on economic growth as the dependent variable using T-statistics and probability measures. The significance level ascertains the bond's strength and linkage between the dependent aspects and variables.

The panel regression analysis method is used in this quantitative research. Secondary data from this research was obtained from the World Bank and UNDP websites. This research used a purposive sampling technique to consider several factors (Sugiyono, 2011). The sampling criteria are ASEAN member countries and countries that present data based on research variables for 2014–2020.

Each ASEAN member country was used as a sample for this research based on the criteria above. After data collection, classic hypothesis testing ensures that the data is unbiased and consistent. Next, Eviews 12 Econometrics tests the hypothesis with simultaneous partial statistics and coefficient of determination. A tool: In this research, all independent variables are used in percentage units; the logarithmic transformation of GDP per person is the dependent variable. Therefore, the equation model used for this research is:

$$PE_{it} = \alpha + \beta_1 IUI_{it} + \beta_2 FDI_{it} + \beta_3 MYS_{it} + \varepsilon_i$$

PE_{it} : Economic Growth (constant GDP 2015)
α : Constant
IUI : Individual Internet User
FDI : Foreign Direct Investment
MYS : Average Years of Schooling
ε_i : Error term

4. RESULT AND DISCUSSION

Effect model regression results still show that variable individual user internet use (IUI) and foreign direct investment (FDI) with a mark probability not enough than 5% impact the economy positively and significantly. However, the average year of study (MYS) did not significantly impact.

Table 1 : Estimated Data

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	2.343.600	1.023.760	2.289.208	0.0000
IUI	0.228078	0.053240	4.283.977	0.0001
FDI	0.008379	0.004752	1.763.153	0.0847
MYS	0.692048	0.551382	1.255.116	0.2159
R^2	0.998849			
Adj R^2	0.998594			
F- statistics				3.906.703
Prob (F- statistic)	0.000000			
Prob. Test Chow	0.0000			
Prob. Haussman test	0.0193			

The Influence of Individual Internet Users on Economic Growth

The results of t-statistical testing using panel data regression show that the probability value of the internet user variable is 0.001. This value is lower than the significant probability value, namely 0.05. Therefore, it can be concluded that the social variable of using the Internet significantly influences the economy. The estimation results show that the coefficient of the internet user variable is positive with a value of 0.001, which indicates that this variable has a significant influence on the economy, with the assumption that an increase in the number of internet users by 1% will increase the economic variable by 0.001.

This follows research conducted by Amrina et al. (2022) on the influence of information and communication technology (ICT) on internet users' projection in East Java Province. In other words, the more internet users there are in East Java Province, the greater the economic growth. Apart from that, observations from Parwanto et al. (2020) show that Indonesia's

economic growth is directly linked to the number of internet users. The regression results show that every increase in Internet users contributes to an increase in the economy.

According to other research (Habibi & Zabardast, 2020), internet users and mobile phone subscriptions have significant positive coefficients. Using OLS fixed effects and GMM methods, this research investigates the influence of information technology and education on economic growth in 24 member countries of the Organization for Economic Cooperation (OECD) and 10 Middle Eastern countries. Based on statistical analysis, it was found that ICT has a more positive effect on economic growth in countries with better education. These results suggest that greater access to education is necessary to generate economic value from the internet.

The Effect of Foreign Direct Investment on Economic Growth

The results of the t-statistical test with panel data regression show that the probability value of the foreign investment variable is 0.0847, significant at the 10% level. Therefore, it can be concluded that the foreign investment variable positively and significantly influences the economy, assuming that an increase in foreign investment by 1% will increase economic variables by 0.0847%. As mentioned above, the economies of eight ASEAN countries were affected by foreign investment.

In addition, it has been found in research (Kambono et al., 2020; Yuniasih & Aisyah Fitri, 2014; Nawaa et al., 2023) that the foreign investment variable has a significance value of less than 0.05, which indicates that H_0 is rejected, which indicates that foreign investment has a significant positive impact on economic growth. Another study (Su & Liu, 2016) examined how FDI and human capital influenced economic growth in 1991–2010. The research results show that human capital and direct investment significantly contribute to economic growth and that human capital helps spread technology shaped by direct investment.

The Effect of Average Years of Schooling on Economic Growth

The results of t-statistical testing using panel data regression show that the probability value of the internet user variable is 0.2159. This value exceeds the significant probability value at 5% or 0.05. Therefore, it can be concluded that the Average Years of Schooling variable does not significantly influence the economy. Research-based on the results of data analysis (Putri et al., 2016) and Widayati et al., 2019) found that education level did not significantly impact the economic growth of Surabaya between 2003 and 2012. This research shows that the education level did not significantly impact the economic growth of the city of Surabaya in a short period.

5. CONCLUSION AND SUGGESTION

This research shows that the internet is a factor that indicates the condition of a country's digital technology; in this study, it is calculated as the percentage of people using the internet to the country's population. Between 2014 and 2020, the Internet influenced the economic growth of eight ASEAN countries. Furthermore, as a macroeconomic variable, foreign direct investment describes the flow of investment to these countries and impacts each country's economic growth from 2014 to 2020. In addition, the average length of schooling is a variable from the Human Development Index, which shows the condition of the source of human power.

Based on the research findings, several key recommendations emerged. First, increasing internet access is very important because the internet plays a significant role in advancing digital technology, which can encourage economic growth in ASEAN countries. Efforts to expand internet access must be a priority. Second, foreign direct investment (FDI) significantly impacts economic growth, so ASEAN countries must create an attractive business environment for foreign investors to increase investment flows and economic development.

In addition, although the average number of years of schooling did not significantly impact economic growth in this study, education is

still essential for improving the quality of human resources. Therefore, ASEAN countries must continue improving access and education quality to encourage human development and long-term economic growth. Furthermore, regional collaboration and integration in improving internet access, increasing FDI, and strengthening education systems are essential for sustainable economic growth. Finally, further research is needed to understand better the relationship between internet use, FDI, education, and economic growth to help design more effective economic and social development policies in ASEAN.

6. REFERENCES

Amrina, Ismatu Febri, Primandhana, & Wiwin Priana. (2022). Analysis of the influence of developments in information and communication technology and education on economic growth. *ECONOMIC FORUM: Journal of Economics, Management and Accounting ISSN: 1411-1713 (24* (2), 483–487.

Budiono, T. (2000). *Economic Growth Theory.* UGM Information Management Publishing Department.

Habibi, F., & Zabardast, M.A. (2020). Digitalization, education and economic growth: A comparative analysis of Middle East and OECD countries. *Technology in Society, 63* (1), 1–9. https://doi.org/10.1016/j.techsoc.2020.101370

Jhingan, M. L. (2016). *Development and Planning Economics* (D. Guritno, Ed.; 1st ed.). Rajawali Press.

Kambono, Herman, Marpaung, & Elyzabet Indrawati. (2020). The Influence of Foreign Investment and Domestic Investment on Indonesia's Economic Growth. *Accounting Journal, Accounting Study Program, Faculty of Economics, Maranatha Christian University, 12* (1), 137–145. http://journal.maranatha.edu

Kuznet, S. (1973). *Modern Economic Growth: Finding and Reflection* (3rd ed., Vol. 63). The American Review.

Miarso, YH (2007). *Seeding Seed Education Technology.* Kencana.

Muana Nanga. (2005). *Macroeconomics: Theory, Problems and Policy.* PT. Raja Grafindo Persada.

Nawaa, Faizatun, Pudjihardjo, & M. (2023). The Influence Of Education, Technology, And Foreign Direct Investment on The Economies Of 5 Asean Countries. *Journal Of Economic And Social Studies Development, 2* (1), 60–73.

Parwanto, Novia Budi, Wulansari, & Ika Yuni. (2020). Analyzing the Role of Information and Communication Technology on Asia's Economic Development: Comparing Lower-Middle, Upper-Middle, and High-Income Asian Countries. *International Journal of Innovation, Creativity and Change. Www.Ijicc.Net, 11* (12), 149–177. https://www.researchgate.net/publication/341281806

Putri, Irane Ade, Soesatyo, & Yoyok. (2016). The Influence of Education Levels and Unemployment Levels on The Economic Growth Of The City Of Surabaya. *Journal of Economic Education, 4* (3), 1–7.

Su, Y., & Liu, Z. (2016). The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities. *China Economic Review, 37,* 97–109. https://doi.org/10.1016/j.chieco.2015.12.007

Subandi. (2016). *Development Economics* (four). Alphabet.

Todaro, M. P., & S. S. C. (2006). *Economic development 8th edition* (8th ed.). Pearson South Asia Pte. Ltd.

UNDP. (2022). *United Nations Development Programme.* UNDP. https://www.undp.org/?search=HDI+

Webster, E. (1999). *The Economics of Intangible Investment.* Edward Elgar Publishing.

Widayati, Heni Wahyu, Laut, Lorentino Togar, Destiningsih, & Rian. (2019). The Influence of The Number of Workforce, Education Levels and The Amount of Unemployment On The Economic Growth Of Magelang District In 1996-2017. *DYNAMIC: Directory Journal of Economics,*

1 (2), 182–194.

World Bank. (2022). *World Development Indicator.* World Bank. World Bank. (2 Https://Databank.Worldbank.Org/Source/World-Development-Indicators.

Yousefi, A. (2011). The impact of information and communication technology on economic growth: Evidence from developed and developing countries. *Economics of Innovation and New Technology, 20* (6), 581–596. https://doi.org/10.1080/10438599.2010.544470

Yuniasih, & Aisyah Fitri. (2014). THE Influence Of Foreign Direct Investme

NT (FDI) On The Economic Growth Of 10 Asean Countries. *Journal Of Statistical Applications & Statistical Computing, 2* (1), 1–18.