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Determinants of Economic Development in ASEAN: The Role of Institutions and Human Capital

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ABSTRACT

Economic development in ASEAN countries is influenced by a range of interrelated factors. Education and life expectancy play a crucial role in enhancing the quality of human resources, which is a key driver of economic growth. Economic transformation, including changes in industrial structure and modernization of the production sector, also contributes to improving regional competitiveness. Adequate road infrastructure facilitates the efficient movement of goods and services, while economic incentives encourage investment and stimulate business activity. Information and communication technology (ICT) and foreign direct investment (FDI) drive innovation and productivity improvements. In addition, innovations in various sectors of the economy help create a competitive advantage at the global level. Economic and political institutions play a crucial role in creating stability and regulations conducive to economic development. However, corruption can be a significant obstacle that reduces the effectiveness of development policies. Case studies in ASEAN show that countries with policies that support education, infrastructure, investment, and good governance tend to experience faster economic growth. Therefore, the synergy between these various factors is key to the success of sustainable economic development in the ASEAN region. Based on the reviews analyzed, this research focuses on the effects of Education, Life Expectancy, economic transformation, Road Infrastructure, Incentives, ICT, FDI, Innovation, economic institutions, Political Institutions, and Corruption on economic development. The research method is carried out with a panel data model by paying attention to classical assumption tests such as, multicollinearity, heteroscedasticity and autocorrelation tests. This research data spans the period from 2010 to 2024 in ASEAN countries. The amount of data in the study was 165. The results of this study indicate that institutional factors, human capital, corruption, Economic Transformation, Road Infrastructure, Incentives, ICT, FDI, Innovation and incentives affect economic development in ASEAN countries. This research is grounded in previous studies and existing theories.

1. INTRODUCTION

Economic development is a significant goal for countries worldwide, including those in the ASEAN region. ASEAN, comprising 11 countries, has experienced significant economic growth over the past few decades. In 2023, ASEAN recorded an average economic growth of 4.7%, with a combined GDP of USD 3.6 trillion [1]. However, challenges such as economic inequality, climate change, and political instability continue to hinder efforts toward inclusive and sustainable development [2].

The per capita income of ASEAN countries varies significantly, reflecting their different levels of economic development, natural resources, and government policies. Singapore has the highest per capita income in ASEAN, exceeding $80,000, thanks to its advanced financial services, trade, and technology sectors. On the other hand, countries such as Myanmar and Cambodia remain at low levels, below $2,000, due to political challenges, limited infrastructure, and dependence on agriculture [3]. Countries such as Indonesia, Thailand, Malaysia, and the Philippines are in the middle tier, with per capita incomes ranging from $4,000 to $12,000, as shown in Figure 1, depending on their primary industries, including manufacturing, tourism, and commodity exports.

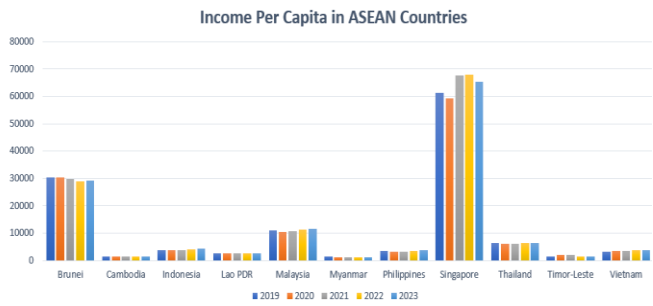

Figure 1. Per capita income in ASEAN countries 2019-2023 [4]

Economic development is not only measured by GDP growth, but also by improved quality of life and equitable access to resources. To achieve this, factors such as education, health, infrastructure, technology and institutions play a crucial role. Therefore, the purpose of this study is to analyze how these variables impact economic development in the ASEAN region.

Education is the primary foundation for improving the quality of human resources. According to UNESCO [5], the average school enrollment rate in ASEAN is 85%, but a notable gap remains between developed countries, such as Singapore, and developing countries, like Cambodia. Quality education can increase labor productivity and drive innovation, which in turn contributes to economic growth.

Strong and stable institutions support a robust investment climate and foster economic development. The World Governance Indicators show that Singapore and Malaysia have high institutional quality, while Myanmar and Cambodia still face challenge [4].

This research is crucial for understanding how various factors, including education, life expectancy, economic transformation, road infrastructure, incentives, ICT, FDI, innovation, financial institutions, political institutions, and corruption, influence economic development in the ASEAN region. By analyzing these relationships, this research can provide evidence-based policy recommendations to promote inclusive and sustainable economic development in the ASEAN region.

Many previous studies on ASEAN as a regional entity have examined how connectivity, trade, and maritime infrastructure significantly influence economic growth [6]. In addition, research by Warunya et al. [7] shows that air cargo volume and the quality of air transportation infrastructure contribute significantly to the economic development of this region. In Latin America, digital development does not directly impact low-level development, but it does influence high-level development [8]. Most studies ignore factors that influence ASEAN's economic Development, such as political and economic institutions, economic transformation, and corruption.

Based on this background, the problem formulation analyzed in this study is the effect of Education, Life Expectancy, economic transformation, Road Infrastructure, Incentives, ICT, FDI, Innovation, financial institutions, Political Institutions, and Corruption. The analysis of this research focuses on economic development, which has been a significant challenge to achieve. Economic development reflects a country or region's progress in enhancing the welfare of its people. One of the measurements is per capita income. ASEAN countries have widely varying per capita incomes, so it is essential to understand the factors that drive or hinder these incomes as a measurement of economic development.

Economic development in ASEAN is influenced by various factors, such as education, life expectancy, economic transformation, road infrastructure, incentives, ICT, FDI, innovation, and the role of economic and political institutions. However, challenges such as corruption and policy gaps between countries still hinder development. This research is crucial for identifying the key factors that influence economic development in ASEAN and providing more effective policy recommendations. By understanding the relationship between these factors, ASEAN countries can design sustainable and globally competitive development strategies. By understanding the role of all these factors, ASEAN countries can design more effective strategies to improve the economic welfare of their people.

2. LITERATURE REVIEW

2.1 Economic development

Economic development is a multidimensional process that reflects progress in a country's economic, social and institutional structure. One of the most commonly used indicators to measure a country's level of economic development is its per capita income, which represents the average income received by each individual in a country. This indicator is used because it provides a rough estimate of people's purchasing power and the macro level of prosperity [9]. According to Todaro and Smith [10], despite not accurately reflecting quality of life or income distribution, per capita income is frequently regarded as the primary proxy for gauging economic well-being. This suggests that while this indicator is helpful, it still has limitations in capturing broader dimensions of development.

Economic development, reflected by consistent long-term increases in per capita income, reflects a country's productive capacity and is often associated with improved access to education, health services, and poverty reduction. However, per capita income should be viewed with caution, as it does not account for the distribution of wealth. In many cases, high per capita income growth is not always accompanied by a reduction in inequality. Therefore, the United Nations Development Programme [11] suggests that per capita income be used in conjunction with other indicators, such as the Human Development Index (HDI), to obtain a more comprehensive picture of development.

2.2 Economic and political institutions

Other studies emphasize the critical role of economic and political institutions in determining the success of economic development. Strong economic institutions can ensure macroeconomic stability and a favorable business climate through effective regulation. Meanwhile, good political institutions, such as a transparent and democratic government, can create effective policies and reduce market uncertainty. The quality of institutions determines economic growth. Conversely, corruption is a significant obstacle to economic development as it reduces the effectiveness of public policies, increases business costs, and discourages foreign investment [12].

An indicator that is no less important than economic variables is the use of ATMs, which illustrates the public's access to formal banking services. High ATM usage reflects greater financial inclusion, which enables people to save, access credit, and conduct transactions efficiently. This financial inclusion has been shown to increase productive investment and support economic growth [13]. Meanwhile, the Democracy Index measures the quality of a country's political institutions. A strong democracy fosters legal certainty, protects property rights, and promotes policy stability, all of which are key factors in attracting both foreign and domestic investment [14]. Both variables are necessary because economic development is not only determined by physical factors such as infrastructure or human capital, but also by the quality of economic institutions (financial access)

and political institutions (democracy). Both ensure that economic growth is not only rapid, but also sustainable, inclusive, and stable.

This study makes a significant contribution by combining these factors in a single analytical model to comprehensively examine economic development in ASEAN. In contrast to previous studies that focused more on individual factors [12]. This study explores the interaction of various variables in the context of the ASEAN region. With this approach, the research is expected to provide more holistic and applicable policy recommendations for ASEAN countries in accelerating inclusive and sustainable economic development.

2.3 Corruption

Corruption is one of the main obstacles to economic development as it undermines the efficiency of resource allocation, reduces productivity, and creates uncertainty for businesses. Corruption is harmful to the country's economic activities. According to Trabelsi [15], corruption weakens public and private investment, hindering long-term economic growth. Furthermore, it asserts that countries with high levels of corruption tend to experience greater social inequality, low-quality infrastructure, and weak governance institutions, which are key to sustainable development.

Recent empirical research by Spyromitros and Panagiotidis [16] shows that corruption has a negative effect on GDP per capita growth in developing countries, with a greater impact when the legal system and institutions are weak. Corruption also causes distortions in public policy decision-making, where projects that benefit corrupt elites are prioritized over programs that people need. Additionally, corruption impacts the quality of bureaucracy and results in low accountability for the utilization of development budgets, particularly in the education, health, and infrastructure sectors [17]. However, in Latin American countries, corruption has a positive effect on economic growth [18].

However, some studies recognize that under certain conditions, corruption can serve as grease the wheels in a rigid bureaucratic system, especially for autocratic systems, as suggested by Assfaw et al. [19]. However, this view is increasingly being abandoned as more empirical evidence supports that the long-term effects of corruption remain systemically damaging to economic development. Therefore, combating corruption through institutional reforms, strengthening oversight systems, and budget transparency are key requirements for achieving inclusive and sustainable economic growth.

2.4 Education and health

There has been extensive research on economic development, highlighting the various factors that influence it. Previous studies have shown that education is a key element in improving labor productivity and innovation, which in turn impacts economic growth [20]. In addition, life expectancy is also linked to economic development through improving the quality of human resources. Healthy human resources tend to be more productive and contribute more to the economy. Countries with higher levels of education and life expectancy tend to have higher per capita income and faster economic development. People with higher education have a big impact on getting good jobs and increasing their income [21].

Some of the indicators of human capital, education, and health reinforce each other: education increases productivity, innovation, and adaptability to modern economic changes, while health, as measured by health expenditure, demonstrates the commitment of the government or society to improving health quality, both of which are crucial foundations of human capital for long-term economic development. This combination enhances the quality of human capital and accelerates economic development [22]. This aligns with Solow's economic growth model, which emphasizes the improvement of the workforce's quality through education, thereby increasing productivity and optimizing the use of physical capital [23].

Education and health are two key pillars of human capital that significantly affect a country's economic growth and development [24]. Investments in education enhance labor skills, productivity, and adaptability to technological change. At the same time, access to quality healthcare ensures the well-being of productive communities and reduces the economic burden of disease. Bloom et al. [25] demonstrate that enhancing the quality of education and health has a direct and significant impact on long-term GDP growth, particularly in developing countries. World Bank [26] also emphasizes that improvements in the Human Capital Index (HCI), which combines education and health indicators, are positively correlated with increased economic competitiveness and reduced inequality. Therefore, sustainable economic development cannot be separated from a strategy of investing in the education and health sectors simultaneously and inclusively.

2.5 Foreign investment

Countries with investment policies that favor high value-added sectors tend to experience faster increases in per capita income. Sustained growth in per capita income can only be achieved through investment in human capital, innovation and inclusive economic governance [26]. However, foreign direct investment (FDI) plays an important role in enhancing economic development through technology transfer, job creation, and increasing the production capacity of recipient countries [27]. FDI is not just necessary, but also a source of optimism for many developing countries, including ASEAN. It provides long-term capital flows that can support infrastructure development, industry, and other productive sectors, and importantly, it creates formal employment. This is a crucial alternative source of financing, overcoming domestic savings constraints and accelerating economic structural transformation [28].

Infrastructure plays a crucial role in driving economic growth and development, particularly by enhancing connectivity, logistical efficiency, and access to markets, public services, and employment opportunities. Transportation, energy, clean water, and digital infrastructure accelerate economic activity, attract investment, and enhance the productivity of strategic sectors, including industry and agriculture. Calderon and Servén [29] demonstrate that enhancing the quality and quantity of infrastructure has a direct impact on GDP per capita growth, particularly in developing countries. The IMF Study [30] confirms that public investment in efficiently designed infrastructure can have significant multiplier effects on long-term economic output. Therefore, infrastructure is not only a physical facility, but also the foundation of structural transformation and equitable economic development.

2.6 Innovation

Innovation has long been recognized as a key driver of economic growth and a means of enhancing a country's competitiveness in the global market. In the context of knowledge-based economic development [31], one important indicator of a country's innovation performance is the export of high-tech products. Technology exports not only reflect the production capabilities of technologically advanced industries, but also indicate success in transforming research and development (R&D) into real economic output. According to the Organisation for Economic Co-operation and Development [32], Exports of high-tech goods are a reliable indicator of a nation's ability to innovate and integrate into global value networks. Therefore, an increase in technology exports reflects the success of the national innovation system in producing high-value-added products and services. Innovation plays a crucial role in driving progress in a country.

The World Bank [33] also emphasizes that the growth of technology exports is the result of a combination of investment in research, institutional quality, intellectual property protection, and collaboration between the public and private sectors. In the context of developing countries, the increase in technology exports also marks the transition from a resource-based economy to an innovation-based economy. As noted in the Global Innovation Index) [34], technology export indicators are a crucial component in assessing the effectiveness of innovation, particularly in the dimension of knowledge and technology outputs.

However, challenges remain. Many developing countries face significant innovation gaps due to limited research infrastructure, low private investment, and lack of connections between universities, industry, and research institutions. Therefore, to increase technology exports, a strong innovation ecosystem and policy incentives that encourage the commercialization of technology are required. As explained by UNCTAD [35], strategic alignment of industrial, scientific, and technological policies is necessary for innovation-driven exports. In other words, technology export indicators not only reflect the results of innovation but also serve as a mirror of national economic policies and the readiness of industrial structures in the face of global competition.

Meanwhile, innovation is a key factor in creating competitive advantage and promoting knowledge-based economic development [36]. The role of economic innovation is connected and evolves within the framework of highly significant social systems. On a micro level, digitization innovation positively affects output.

2.7 Information technology

Information and Communication Technology (ICT) has been proven to accelerate the digitalization of the economy, improve the efficiency of the business sector, and expand access to global markets [37]. This digitalization boosts industry and drives economic growth. ICT deployment has a positive effect on sustainable and inclusive development in the Middle East and North Africa but in some countries ICT is still underdeveloped.

The development of Information and Communication Technology (ICT) has revolutionized various aspects of human life, ranging from economic activities, education, to governance. One of the most prominent indicators in measuring ICT penetration and impact is the level of mobile phone usage. This indicator not only reflects access to communication technologies, but also serves as a proxy for digital connectedness and potential participation in the digital economy. According to the International Telecommunication Union [38], one important measure of ICT access is mobile cellular subscriptions, particularly in developing nations with sparse fixed-line infrastructure. In other words, the use of mobile phones has become a significant symbol of the democratization of technology access at all levels of society.

The rapid increase in mobile phone ownership and usage has created a wide range of opportunities in economic and social development. The World Bank's Report [39] emphasizes that the spread of mobile technology enables more inclusive access to digital financial services, market information, and public services. This is particularly significant in rural areas and developing countries, where mobile technology has leapfrogged conventional infrastructure barriers. The World Economic Forum [40] notes that the growth of mobile broadband plays an important role in promoting digital inclusion and narrowing the digital divide between countries and social groups. Information technology is essential because it enables modern economic development by expanding access to information, opening markets, increasing financial inclusion, and facilitating the transition to a digital economy.

2.8 Economic transformation

In terms of economic transformation, research shows that changes in the structure of the economy from traditional sectors to more productive industrial and service sectors are the main drivers of a country's economic development [41]. Economic transformation through diversification of productive sectors and enhancement of value-added products are the main focus for ASEAN countries.

Economic transformation is necessary because it describes long-term changes in economic structure. According to Kuznets [42], classical development theory, this structural transformation is considered a key feature of modern economic development, which shows that a country is moving from the primary and secondary sectors to the tertiary sector. The service sector is often the engine of economic growth in the era of globalization and digitalization. Therefore, the ratio of services to GDP is a crucial indicator in research because it reflects structural transformation, which not only indicates economic growth but also changes in the quality of work, economic diversification, and global integration.

According to McMillan et al. [43], economic transformation is essential for sustained growth in developing countries, as it reallocates resources to more productive activities. Government actions and policies are required in order for this structural change to be successful. This means that without structural transformation, developing countries will remain trapped in the middle-income trap and productivity stagnation.

The OECD report [44] states that countries that successfully transform their economies exhibit specific characteristics, such as high investment in education and infrastructure, export diversification, and institutional reform. Economic transformation is also triggered by the adoption of technology, integration into global value chains, and an increase in domestic innovation capacity. For example, the success of South Korea and Vietnam in increasing industrial value-added and reducing dependence on the primary sector serves as an inspiring model for many developing countries.

However, the process of economic transformation is not always smooth. Many countries face structural challenges, including a lack of skilled human capital, inefficient bureaucracy, and regional inequality. As stated by the World Bank [39], this study investigates how different variables interact within the ASEAN region. Transformation must also pay attention to the dimension of inclusiveness to prevent widening social disparities, both between regions and income groups. Economic transformation is not only about growth, but also about the direction and quality of growth itself. Countries that can balance innovation, sustainability, and inclusiveness in their transformation strategies will be better prepared to face future challenges.

2.9 Infrastructure

Infrastructure development has long been recognized as a crucial foundation for supporting economic growth, particularly in developing countries. According to Ma'rifah [45], public investment in infrastructure, such as roads, bridges, and transportation facilities, increases private sector productivity by lowering logistics costs and improving production efficiency. One indicator that represents accessibility, investment attractiveness, market integration, and the multiplier effect of infrastructure on economic development is the number of airport passengers, which reflects the level of connectivity between regions, both domestic and international. The higher the air mobility, the greater the opportunity for goods, services, capital, and labor to move more quickly and efficiently, which is the primary foundation of modern economic development. This finding aligns with the results of Timilsina et al. [46], who analyzed panel data from developing countries and demonstrated that the quality and quantity of infrastructure have a strong positive correlation with GDP per capita growth.

In developing countries, infrastructure development not only increases economic activity but also reduces regional inequality. Osuma [47] mentioned that equitable infrastructure can create connectivity between regions, open market access, and reduce barriers to labor and goods mobility. Empirical studies by Zondo [48] demonstrate that transportation and energy infrastructure play a significant role in driving increased private investment and long-term economic growth. However, the effectiveness of infrastructure is highly dependent on the quality of institutions and project governance. A comprehensive and sustainable approach to infrastructure development can significantly accelerate economic progress in emerging markets.

A study by Nisa and Khalid [49] using panel data from districts in both developed and developing countries shows that transportation, communication, and electricity infrastructure have a positive effect on the GDP growth rate, particularly in developing countries, whereas in developed countries, the effect is more limited. This suggests that developing countries are still at the stage where additional infrastructure investment provides substantial benefits to economic welfare. In Sub-Saharan Africa, Abdullahi and Sieng [50] found a positive relationship between water supply, sanitation, electricity, and economic growth. However, transportation infrastructure and ICT showed a negative correlation in the short term.

In China, infrastructure investment in the Yangtze River Economic Zone triggered regional economic growth according to the big push theory and generated spillover effects in surrounding areas. However, other studies suggest that ineffective large investments can also trigger imbalances and crowding-out of the human capital sector.

2.10 Incentive

One indicator of the incentive variable is that worker incentives are necessary because they serve as a link between labor policies and economic development: increasing productivity, reducing informality, strengthening social protection, and supporting long-term economic competitiveness. Research by Demirgüç-Kunt et al. [51] indicates that incentives targeting job protection, such as wage subsidies and job retention schemes, during the COVID-19 pandemic are positively correlated with GDP growth, increased employment rates, and reduced poverty in countries with weak social security systems. These schemes allow firms to retain workers instead of laying them off during a crisis, thereby stabilizing aggregate consumption and demand. These findings support the view that worker protection is not an economic burden, but a form of socio-economic investment that supports short-term recovery more effectively than cash incentives alone.

Incentives also play a crucial role in enhancing the productivity of priority sectors, particularly manufacturing industries and technology sectors. According to Banga and Velde [52], performance-based incentives, such as tax holidays and matching grants, increased the output and efficiency of local businesses in East Africa. However, they also emphasize that the effectiveness of incentives depends heavily on the quality of institutions and governance. In environments with high corruption, incentives can lead to market distortions and dependence on government support.

Social incentives, such as wage subsidies, job security, and vocational training, also play a crucial role in inclusive economic development. Demirgüç-Kunt et al. [51] found that worker protection schemes during the pandemic, such as wage subsidies and job guarantee programs, significantly accelerated economic recovery and maintained household consumption. This strengthens the argument that incentives designed to enhance the labor market are not only a form of social protection, but also a short- and long-term economic stimulus.

3. RESEARCH METHODS

The data in the study are in the form of panel data, sourced from various reputable institutions, including the World Development Indicator, World Bank, UNESCO, International Telecommunication Union, UNCTAD, Global Innovation Index, World Governance Indicators, Transparency International, and Economist Intelligence Unit, spanning the period from 2010 to 2023 in ASEAN countries. The econometric model, which employs panel data analysis with either a fixed effects or random effects approach, is designed to test the significance and direction of the influence of each variable on economic development. The amount of data in the study is 165. The data includes key indicators representing each variable, such as average years of education, life expectancy, total foreign direct investment, infrastructure condition, and corruption perception index. This data processing aims to develop a solid empirical base.

To clarify the existence of each variable used, the operational definitions are as follows (Table 1):

Table 1. Definitions of variables & symbols

No.	Variable	Indicator
1	Economic Development (Y)	Per capita income in dollars
2	Economic Institutions (X1)	ATM usage per 100,000 adults in percent
3	Political Institutions (X2)	Democracy index in percent
4	Corruption (X3)	corruption control index in percent
5	Education (X4)	Number of years of schooling completed, including tertiary or higher education, in units of years
6	Health(X5)	Health spending in dollars
7	Foreign Direct Investment (X6)	Foreign direct investment in billion dollars
8	Innovation (X7)	High-tech manufacturing exports as a percentage
9	Information Technology and Telecommunications (X8)	Cellular phone usage per 100 people in percent
10	Economic Transformation (X9)	Ratio of services to Gross Domestic Product in percent
11	Infrastructure (X10)	Number of airport passengers in units of people
12	Incentive (X11)	Change in incentives provided to workers in million dollars

The equation model in this study is as follows:

$$Yit = \beta 0 + \beta 1\, X_{1it} + \beta 2\, X_{2it} + \beta 3 X_{3it} + \beta 4\, X_{4it} + \beta 5\, X_{5it} + \beta 6\, X_{6it} + \beta 7\, X_{7it} + \beta 8\, X_{8it} + \beta 9\, X_{9it} + \beta 10\, X_{10it} + \beta 11\, X_{11it} + \mu it \quad (1)$$

4. RESULTS AND DISCUSSION

The classical assumption test is conducted to ensure that the linear regression model used in this study meets the basic statistical requirements. Tests include assumptions of multicollinearity, autocorrelation, and heteroscedasticity. With the fulfillment of these assumptions, the resulting model will be more valid, unbiased, and can provide accurate and reliable estimates for decision-making.

4.1 Classical assumption test

4.1.1 Heteroscedasticity test

In a study, the heteroscedasticity test is conducted to determine whether there is equal variance or heterogeneity in residuals from one observation to another. The data in question generally has small, medium, and significant size characteristics. In this study, the heteroscedasticity test used the Harvey Test. The results of the heteroscedasticity test are as follows (Table 2):

Table 2. Heteroscedasticity test results

Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	32.41423	1.127789	28.74139	0.0000
X1	0.012872	0.010859	1.185404	0.2379
X2	1.155475	0.983158	1.175269	0.2419
X3	0.36231	0.68393	0.529748	0.5971
X4	-0.042919	0.028651	-1.498014	0.1364
X5	-0.000569	0.002399	-0.237375	0.8127
X6	3.48E-12	2.36E-11	0.147522	0.8829
X7	-0.01474	0.015187	-0.970535	0.3335
X8	-0.010967	0.007005	-1.565717	0.1197
X9	-0.006148	0.022081	-0.278415	0.7811
X10	-4.66E-11	1.02E-08	-0.004578	0.9964
X11	3.83E-13	2.24E-13	1.711678	0.0892

Source: Eviews 9, Data Processed

The results above, it can be seen that the probability value of the variables of economic institutions (X1), political institutions (X2), corruption (X3), education (X4), health (X5), foreign direct investment (X6), innovation (X7), information and communication technology (X8), economic transformation (X9), infrastructure (X10) and incentives (X11) is greater than alpa 0.05. This result indicates that the data does not have a heteroscedasticity problem.

4.1.2 Multicollinearity test

The multicollinearity test is conducted to identify variables that exhibit correlation among the independent variables. The effect of this multicollinearity is a strong correlation between variables, which renders the research analysis results unfavorable.

According to the results (Table 3), it can be seen that the correlation between the independent variables has a coefficient value smaller than 0.8. This is by the test criteria, where a correlation coefficient value of less than 0.8 indicates that there is no multicollinearity problem. So, it can be concluded that the data in this study does not exhibit multicollinearity.

4.1.3 Autocorrelation test

One of the most commonly used autocorrelation tests is the Durbin-Watson Test, which yields a value between 0 and 4. A value close to 2 indicates no autocorrelation. So, based on the Durbin Watson table with α=5%, the following data can be obtained (Table 4).

Table 3. Multicollinearity test results

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
X1	1	0.655291	0.483809	0.560310	0.212864	0.235576	0.512537	0.639496	0.101949	0.3441431	-0.07175
X2	0.655291	1	0.43683	0.367947	0.741109	0.666436	0.736099	0.552436	0.399092	0.2431028	-0.23573
X3	0.483809	0.43683	1	0.306626	0.783392	0.685314	0.622212	0.470073	0.465594	0.1101324	0.22800
X4	0.56031	0.367947	0.306626	1	0.128530	0.779705	0.728308	0.558882	0.601015	0.383039	0.04980
X5	0.212864	0.741109	0.783392	0.128530	1	0.445743	0.603215	0.346138	0.596544	0.485934	-0.16726
X6	0.235576	0.666436	0.685314	0.779705	0.445743	1	0.561814	0.356013	0.537932	0.1736954	-0.14223
X7	0.512537	0.736099	0.622212	0.728308	0.603215	0.561814	1	0.444921	0.448330	0.2705256	-0.20108
X8	0.639496	0.552436	0.470073	0.558882	0.346138	0.356013	0.444921	1	0.308573	0.408370	-0.01634
X9	0.101949	0.399092	0.465594	0.601015	0.596544	0.537932	0.44833	0.308573	1	0.1575204	0.119216
X10	0.344143	0.243103	0.110132	0.383039	0.485934	0.173695	0.270526	0.408370	0.157520	1	432,875
X11	-0.07175	-0.23573	-0.22800	-0.04980	-0.16726	-0.14223	-0.20108	-0.01634	0.119216	0.4328753	1

Source: Eviews 9, Data Processed

Table 4. Durbin watson (DW) test

Number of Samples (N)	165
Number of dependent variables (K)	1
DW Stat value	1.7399
DL value	1.7332
Score 4-DL	2.2668
DU value	1.7576
Score 4-DU	1.2424

Source: Eviews 9, Data Processed

According to the data above, it can be concluded that the value of DL <DW<DU, or 1.7332<1.7399<1.7576.

According to the above criteria, it is evident that this data does not exhibit autocorrelation.

4.2 Inductive analysis

4.2.1 Panel data regression model selection

a. Chow test

The Chow test is used to determine which model, between the Common Effect and Fixed Effect, will be employed in the research model. The following are the results of the Chow Test:

Table 5. Chow test results

Effect Test	Statistic	d. f.	Probability
Cross-section F	2.211591	(14.139)	0.0007
Cross-section Chi-Square	33.18192	14	0.0001

Source: Eviews 9, Data Processed

The Chow Test results in Table 5, it can be seen that the Chi-Square probability value is 0.0003, which is smaller than α=0.05. Then Ho is rejected and Ha is accepted, so the Fixed Effect Model is more appropriate to use in this study compared to the Commond Effect Model.

b. Hausman test

The Hausman test is used to determine which model, Fixed Effect or Random Effect, will be employed in the research model. The following are the results of the Hausman Test:

Table 6. Hausman test results

Test Summary	Chi. Sq Statistic	Chi- Sq Df	Probability
Cross-section random	40.205013	11	0.0000

Source: Eviews 9, Data Processed

The Hausman Test results in Table 6 above, it can be seen that the Chi-Square probability value is 0.0015, which is smaller than α=0.05. Then Ho is accepted and Ha is rejected, so the Fixed Effect Model is more appropriate to use in this study compared to the Random Effect Model.

4.2.2 Regression estimation results

In this study there are variables of economic institutions (X1), political institutions (X2), corruption (X3), education (X4), health (X5), foreign direct investment (X6), innovation (X7), information and communication technology (X8), economic transformation (X9), infrastructure (X10) and incentives (X11) as independent variables. While the economic development variable (Y) is used as the dependent variable. After conducting the best model selection test above, the following are the results of the regression estimation equation with the Fixed Effect Model (Table 7).

Based on the data analysis, the panel data equation results are as follows:

$$\begin{aligned} Y_{it} = \; & 30298.59 + 112.6620X_{1it} + 10755.95X_{2it} \\ & + 5969.540X_{3it} - 301.6351X_{4it} \\ & + 31.74524X_{5it} + 7.63E08X_{6it} \\ & - \; 223.8769X_{7it} - 49.12443X_{8it} \\ & - 93.59458X_{9it} - 7.91E05X_{10it} \\ & + 6.95E10X_{11it} \end{aligned} \quad (2)$$

Table 7. Panel data test results: Model fixed effect

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30298.59	1733.458	17.47870	0.0000
X1	112.6620	16.69079	6.749952	0.0000
X2	10755.95	1511.153	7.117713	0.0000
X3	5969.540	1051.228	5.678633	0.0000
X4	-301.6351	44.03764	-6.849485	0.0000
X5	31.74524	3.687181	8.609624	0.0000
X6	7.63E-08	3.62E-08	2.107233	0.0009
X7	-223.8769	23.34353	-9.590534	0.0000
X8	-49.12443	10.76652	-4.562701	0.0000
X9	-93.59458	33.94002	-2.757647	0.0066
X10	-7.91E-05	1.56E-05	-5.055440	0.0000
X11	6.95E-10	3.44E-10	2.0193489	0.0004
	Effects Specification			
	Period Fixed (Dummy Variables)			
R-squared	0.975752	Mean dependent var	11711.26	
Adjusted R-squared	0.971391	S.D. dependent var	18982.26	
S.E. of regression	3210.694	Akaike info criterion	19.13004	
Sum squared resid	1.43E+09	Schwarz criterion	19.61946	
Log likelihood	-1552.228	Hannan-Quinn criterion.	19.32871	
F-statistic	223.7388	Durbin-Watson stat	1.739926	
Prob(F-statistic) 0.000000				

Source: Eviews 9, Data Processed

The panel data analysis equation above, it can be seen that economic institutions (X1) have a positive effect on economic development (Y) with a regression coefficient of 112.6620. This means that if economic institutions increase by 1%, economic development will increase by 112.6620%. Political institutions (X2) have a positive effect on economic

development (Y) with a regression coefficient of 10755.95. This means that if political institutions increase by 1%, economic development will increase by 10755.95%. Corruption (X3) has a positive effect on economic development (Y) with a regression coefficient of 5969.540. This means that if corruption increases by 1%, economic development will increase by 5969.540%.

Education (X4) has a negative effect on economic development (Y) with a regression coefficient of -301.6351. This means that if education increases by 1%, then economic development decreases by -301.6351%. Health (X5) has a positive effect on economic development (Y) with a regression coefficient of 31.74524. This means that if health increases by 1%, economic development will increase by 31.74524%. Foreign direct investment (X6) has a positive effect on economic development (Y) with a regression coefficient of 7.63E08. This means that if foreign direct investment increases by 1%, economic development will increase by 7.63E08%. Innovation (X7) has a negative effect on economic development (Y) with a regression coefficient of -223.8769. This means that if innovation increases by 1%, economic development will decrease by -223.8769%.

Information and communication technology (X8) has a negative effect on economic development (Y) with a regression coefficient of -49.12443. This means that if information and communication technology increases by 1%, economic development will decrease by -49.12443%. Economic transformation (X9) has a negative effect on economic development (Y) with a regression coefficient of -93.59458. This means that if economic transformation increases by 1%, economic development will decrease by -93.59458%. Infrastructure (X10) has a negative effect on economic development (Y) with a regression coefficient of -7.91E05. This means that if infrastructure increases by 1%, economic development will decrease by -7.91E05%. Incentives (X11) have a positive effect on economic development (Y) with a regression coefficient of 6.95E10. This means that if incentives increase by 1%, economic development will increase by 6.95E10%.

4.2.3 Determinants of economic development

1) The influence of economic institutions on economic development

Economic institutions are the formal and informal structures that shape the rules of the game in a country's economic activities. These institutions include banking, financial systems, market regulation, and protection of property rights. In the context of ASEAN, the role of economic institutions is crucial as its member countries are at various stages of development and economic integration. One important indicator that reflects the effectiveness of economic institutions in facilitating access to finance is the number of ATMs per 100,000 adults.

The number of ATMs per 100,000 adults is an indicator of the accessibility of financial services in the community. The results indicate that financial institutions have a substantial impact on economic development in ASEAN. ATMs enable individuals to conduct basic transactions, such as cash withdrawals, transfers, and balance checks, without needing to visit a bank. The higher this number, the wider the reach of the formal financial system to the community. In the context of economic institutions, a higher number reflects better financial system efficiency and financial inclusion. The link between economic institutions and economic development becomes clearer when examining countries like Singapore and Malaysia, which have mature financial infrastructure and high penetration of financial services. In these countries, the number of ATMs per 100,000 adults is high, which goes hand in hand with high per capita income. This suggests that efficient economic institutions can provide adequate financial services and support economic growth.

In line with research by Saadaoui Mallek et al. [53], developing countries generally have lower ATM rates per 100,000 adults. This indicates limitations in the provision of formal financial services that can hamper economic activity, particularly in rural areas. Weak economic institutions in these countries have a direct impact on low per capita income, as people struggle to access financial instruments to support productivity. In the digital era, the role of ATMs extends beyond being a means of withdrawing money to also symbolize progress in financial infrastructure. ATMs integrated with digital banking services demonstrate the readiness of economic institutions to adapt to technological transformation. ASEAN countries that develop these services show significant improvements in economic efficiency and productivity, which are then reflected in increased income per capita.

2) The influence of political institutions on economic development

Political institutions play a central role in determining the direction and quality of a country's development. In the ASEAN region, strong and democratic political institutions often create more stable and conducive conditions for economic growth. The Democracy Index is one of the important measuring tools for assessing the extent to which a country has a participatory, transparent, and accountable political system. The higher the democracy index score, the greater the potential of the political institutions to promote inclusive and sustainable economic development.

This result is supported by Georgescu et al. [54], who believe that democracy has a significant influence on economic development, allowing for a balanced distribution of power and providing space for people to voice their interests. When people can actively participate in the political process, they are more involved in economic development. Democratically elected governments also tend to be more responsive to the needs of the people, so that the economic policies implemented become more relevant and targeted. This has a positive impact on increasing per capita income. Democratic political institutions usually have a stronger and more independent legal system. Legal certainty and protection of property rights are important factors for investors, both domestic and foreign. When investors feel safe and confident in legal stability, they are more likely to invest. This investment then creates new jobs, increases productivity, and ultimately has a direct impact on rising per capita income.

Transparency and accountability are fundamental principles in democracy that also promote the efficient use of the state budget. Transparent political institutions tend to minimize corrupt practices and budget abuse. Well-managed public funds enable optimal development of infrastructure, education, and health. All these factors support economic growth, which in turn increases people's per capita income. Additionally, democracy provides a platform for the emergence of new and innovative ideas from diverse segments of society. In an open system, economic policies are not only determined by the political elite but also involve input from academics,

businesses, and civil society. This broad participation makes economic policy more adaptive to changing times and global challenges, strengthening the national economic structure amid international competition. Democratic political institutions are also more likely to prioritize the social justice aspects of economic development. They aim to reduce income inequality and ensure that economic growth benefits all levels of society. This type of equitable development is crucial for maintaining social stability and enhancing people's purchasing power, which also has a positive impact on increasing per capita income.

When political institutions are not accountable, economic policies become vulnerable to short-term interests and elite groups. This can lead to inefficient resource allocation and slow economic growth. Social inequality also widens, worsening poverty levels and reducing people's quality of life. All of this has a negative impact on per capita income. Developing countries have demonstrated that, although their political systems are not fully democratic in the liberal sense, the presence of efficient, clean, and stable political institutions can still promote economic development. However, in the long run, countries with a combination of political democracy and good governance will have a greater advantage in maintaining the sustainability of economic growth and people's welfare. The cross-country comparison also shows that the democracy index is not the only determining factor, but an essential component in the overall development ecosystem. When political institutions are able to guarantee civil liberties, the rule of law, and effective oversight of the government, an enabling environment for business climate and inclusive economic growth is created.

3) The effect of corruption on economic development

The corruption control index has a significant influence on economic development, especially in the context of developing ASEAN countries. The index reflects the extent to which corruption can be prevented or controlled by state institutions. When corruption is under control, investor confidence and bureaucratic efficiency increase, which in turn boosts overall economic growth. This has direct implications for increasing per capita income, one of the primary indicators of economic development.

This finding that corruption has a positive effect on economic development in ASEAN can be explained through the "Grease the Wheels" Theory [17], whereby short-term corruption can actually accelerate complicated bureaucratic processes and open up access to investment and economic activity, especially in developing countries with weak institutions. In addition, heterogeneity among ASEAN countries also influences the results, as countries with high levels of corruption are still able to record economic growth through the exploitation of natural resources or large FDI flows. However, it should be emphasized that this positive effect is temporary, as the literature continues to show that in the long term, corruption is detrimental to development and weakens governance.

High corruption reduces the efficiency of public and private resource allocation. Development projects are often managed sub-optimally or even stalled due to misappropriation of funds. In the long run, this weakens infrastructure and the quality of public services, such as education, health, and transportation, all of which are essential foundations for supporting increased productivity and per capita income. In addition, corruption creates uncertainty in the business world. Local and foreign companies will face additional risks in the form of unofficial fees and inefficient bureaucratic procedures. Under these conditions, investors will be reluctant to invest, hampering employment and productivity growth. As a result, people's incomes do not increase significantly, and economic disparities widen.

Effective anti-corruption policies also strengthen governance. Transparent and accountable governments tend to manage public budgets more effectively and establish economic policies that promote long-term development. Thus, poverty alleviation and human capital development programs are optimized, increasing national productivity and boosting per capita income.

The effect of corruption control on per capita income is not instantaneous. Institutional reforms take time and strong political commitment. In some countries, challenges such as weak rule of law and resistance from political elites are the main obstacles to corruption eradication efforts. Therefore, corruption eradication strategies must be accompanied by broader systemic reforms. Civil society education and engagement also play a crucial role in strengthening anti-corruption measures. Public awareness of the importance of integrity and transparency in government can reduce corrupt practices. In the long run, this creates a healthier economic environment, improves citizens' quality of life, and ultimately boosts per capita income. Overall, the correlation between corruption control and economic development, as measured by per capita income indicators in ASEAN countries, suggests that clean and transparent governance is a crucial key to creating inclusive and sustainable economic growth. Improving the corruption control index is not just about reducing corruption, but also about establishing a robust institutional framework to achieve equitable public welfare.

4) The effect of education on economic development

Education plays a key role in a country's economic development, especially in the context of ASEAN countries. A critical indicator of the quality of education is the ratio of higher education graduates to the total population. This indicator illustrates the proportion of the population with higher abilities and skills acquired through formal education. The higher this ratio, the greater the potential for quality human resources to drive a country's economic growth.

The study's results indicate that education has a negative impact on economic development in ASEAN. This finding can be explained by the fact that an increase in the average length of schooling is not always accompanied by adequate quality of education and suitability to the needs of the labor market, resulting in skills mismatch and educated unemployment. In addition, significant investments in the education sector that are inefficient can actually burden the budget without having a significant productive impact on the economic sector. Variations among ASEAN countries that still face challenges in education quality and structural transformation also reinforce these results, so that the contribution of education to economic development in the region tends to be negative.

Research results from Kostis [55] indicate that higher education graduates tend to possess more complex skills and broader knowledge than those who have only completed primary or secondary education. Thus, they are more capable of innovating, increasing work productivity, and creating added value in various economic sectors. This will have a direct impact on increasing per capita income, a key indicator of economic development. The high proportion of university

graduates has driven the growth of technology-based industries, financial services, and the digital economy. This success demonstrates that investing in higher education yields significant long-term returns on national economic growth. Countries with a lower ratio of higher education graduates tend to have relatively low per capita incomes. This indicates that limited access to higher education is an obstacle in developing the economic capacity of the society. Inequality in the education system also leads to inequality in income distribution, which can hinder overall economic development.

Higher education also contributes to improving the quality of the workforce through the development of specialized skills, such as analytical, managerial, and technical abilities. In the context of globalization and the industrial revolution 4.0, the need for a highly competent workforce is increasing. Countries that successfully prepare their human resources through quality higher education will be better equipped to compete in the global market and attract greater foreign investment. In addition, higher education facilitates the formation of innovative entrepreneurship, which is the driving force of local and national economies. College graduates with business and technological knowledge can create new jobs, reduce unemployment, and broaden the economic base. This reinforces the link between education and sustainable economic development.

Chen et al. [56] address the challenge of realizing this; consistent policy support from the government is needed, including in the form of education budgets, equitable access to higher education, and cooperation between educational institutions and industry. Without supportive policies, increasing the number of higher education graduates will not fully provide an optimal economic impact. The ratio of higher education graduates to the total population can also reflect the level of public awareness of the importance of education as a means of social mobility. The higher this awareness, the greater the drive to improve the quality of life through education, which in turn strengthens the country's economic competitiveness at the regional and global levels.

5) The impact of health on economic development

Health is a crucial foundation for driving a country's economic development. In the ASEAN region, the link between health and economic development is evident in the impact of health spending on per capita income. Countries that allocate adequate budgets to the health sector tend to have healthier and more productive populations, which in turn can increase national economic output.

In line with research by Elgin [57], significant health spending reflects the government's commitment to ensuring equitable access to quality healthcare services. This access allows people to maintain and improve their physical and mental conditions, which are indispensable in supporting work productivity. A healthy workforce is better equipped to work consistently, creatively, and efficiently, thereby supporting sustainable economic growth. Low spending on the health sector can lead to high rates of communicable and non-communicable diseases, which in turn suppress population productivity. In ASEAN countries that still have limited health budget allocations, inequality in access to medical services is one of the main obstacles in achieving equitable and inclusive economic development.

The increase in a country's per capita income is strongly influenced by the quality of its human resources. Investment in health through adequate spending creates a society that is able to participate more actively in economic activity, both in the formal and informal sectors. Countries such as Singapore and Malaysia, which have relatively advanced healthcare systems, exhibit a positive correlation between health spending and economic growth, driven by increased per capita income. The importance of health as human capital puts it on par with education in long-term development strategies. ASEAN countries that are beginning to realize this are trying to integrate health policies into national economic policies. This will not only improve the welfare of the people, but also strengthen regional and global economic competitiveness.

Effective health spending also plays a role in preventing the long-term economic burden of chronic diseases. With the right investments in prevention and treatment programs, countries can reduce spending on expensive disease management, while maintaining fiscal sustainability and promoting per capita income growth. In addition, the health sector itself is one of the economic sectors that can create jobs and encourage the development of supporting industries, such as pharmaceuticals, medical devices, and health information technology. In other words, increased spending in this sector also has a multiplicative effect on the economy as a whole. However, health spending must be accompanied by efficiency and good governance. Without an effective distribution and service delivery system, even significant investments will not have the maximum impact on economic development. Therefore, institutional reforms and innovations in the health system are crucial to achieving success in creating a positive impact on per capita income.

6) The effect of foreign direct investment on economic development

FDI is often considered one of the main drivers of economic development, including in the ASEAN region. However, in some cases, the relationship between FDI and economic development, particularly as measured by per capita income, does not always show a significant effect. This insignificance raises questions about the extent to which FDI promotes equitable and sustainable economic growth.

This research is in line with Guney et al. [58] suggest that one of the main reasons why FDI does not always have a significant impact on per capita income is that profits from foreign investment are often unevenly distributed in the domestic economy. Many foreign companies repatriate profits to their home countries, so most profits do not contribute directly to increasing the income of local people. This limits the potential of FDI to promote widespread welfare improvement. In addition, FDI in developing countries is often concentrated in specific sectors, such as manufacturing and extractives, which have limitations in creating high-quality jobs. When most of the local workforce is relegated to low-level positions without adequate training or technology transfer, the impact on increasing per capita income is minimal. This also reinforces economic disparities between groups of people. In some cases, FDI can also lead to “structural dependence” on foreign capital, where a country's economy becomes highly dependent on foreign investment inflows. When FDI flows slow down or shift to other countries due to global dynamics, the recipient country becomes vulnerable to economic stagnation. This can reduce the long-term resilience of the economy and minimize the potential for increasing per capita income.

Elgin [57] also notes that the success of FDI in promoting economic development is highly dependent on the institutional

capacity of the recipient country. In this context, even when investment comes in, its impact on productivity and income remains low due to unresolved structural barriers. Moreover, the effect of FDI on per capita income is long-term and indirect. In the short term, the inflow of FDI may not necessarily increase the average income of the people, as it takes time to build production networks, infrastructure, and competent human resources. Therefore, the impact of FDI on income is often only visible after a few years, if there are no structural imbalances that hinder it.

Amu et al. [59] suggest that developing countries also exhibit varying levels of economic readiness, resulting in different FDI yields. A country like Singapore may be better equipped to manage and direct FDI to strategic sectors that boost per capita income. In contrast, other countries with low readiness will struggle to utilize FDI effectively. These differences create regional disparities in the economic outcomes achieved. Furthermore, while FDI often brings new technologies, innovations and modern management practices, not all countries are able to absorb these benefits optimally. Limitations in the education and training systems of the local workforce hinder the transfer of technology and skills, which should be the primary pathway for increasing people's productivity and income. FDI is also often oriented towards short-term gains and does not always consider the long-term development of the recipient country. In some cases, foreign companies simply utilize local resources without a strong commitment to contributing to inclusive economic development. This makes the relationship between FDI and increased per capita income weak or insignificant.

7) The effect of innovation on economic development

Innovation plays a crucial role in driving high-tech exports, which in turn have a substantial impact on a country's manufacturing export structure and overall economic development. In the ASEAN region, countries that invest in research and development (R&D), higher education, and technological infrastructure tend to see an increase in exports of high-tech goods. These products typically have high added value, which can strengthen export competitiveness and increase the total value of manufacturing exports.

This research aligns with Nawir et al. [60], who believe that high-tech exports reflect a country's ability to master and apply advanced technology in its industrial sector. When a developing country manages to increase the proportion of high-tech exports in its manufacturing export portfolio, it not only earns more revenue but also creates spillover effects in terms of labor skills upgrading and the growth of other economic sectors. This has a direct impact on increasing national productivity. The increase in high-tech manufacturing exports is often an indicator of structural transformation in a country's economy with a large contribution of high-tech exports to total manufacturing exports, showing a strong positive correlation with an increase in per capita income. Per capita income, as an indicator of economic development, increases when the economy shifts from low-wage labor-intensive sectors towards technology-intensive and export-oriented sectors.

Abdelaty et al. [61] suggest that the effect of innovation on high-tech exports is not automatic. A supportive ecosystem is required, including government policies that encourage collaboration between the public and private sectors, as well as investment in education and intellectual property protection. The role of research institutions and partnerships with global industries is also a key driver of innovation-based exports. Countries that can create synergies between academic research and industrial market needs are more successful in commercializing innovations. This will strengthen the position of manufacturing exports in the global market, resulting in a sustainable increase in per capita income. Meanwhile, countries with low levels of innovation tend to have manufacturing exports dominated by low-value-added products, such as raw materials or assembled components. Dependence on these types of exports often results in stagnant and non-inclusive economic growth, as their contribution to national income and quality job creation is relatively limited.

In the context of globalization and rapid technological change, countries that continue to innovate will be better able to withstand external shocks, such as financial crises or supply chain disruptions. This is important for countries that are strengthening their position in the global economy. Generally, an increase in high-tech exports resulting from innovation broadens the country's economic base and enhances its integration into global value chains. This integration enables access to broader markets, facilitates increased technology transfer, and accelerates the modernization of the industrial sector, all of which contribute to growth in per capita income. In addition, success in innovation and high-tech exports will enhance the image and attractiveness of FDI. FDI contributes to capital formation, job creation, and an increase in national production capacity [62]. The combination of all these factors strengthens the foundation of long-term economic development.

8) The effect of information and communication technology on economic development

Information and communication technology, particularly the use of mobile phones, has become one of the key factors in driving economic growth in ASEAN countries. Cellular phones enable fast and widespread access to information, thereby accelerating business processes, trade, and communication between individuals and companies. With increased mobile phone penetration, people can connect more easily, which opens up new opportunities for economic activity and innovation.

This research is supported by Becha et al. [63]. Additionally, these studies found that the high use of cellular phones per 100 people indicates that communication technology is more evenly distributed and easily accessible to the community. This has a direct impact on increasing productivity as individuals and businesses can utilize the technology to optimize existing resources. For example, small and medium entrepreneurs can use mobile phones to market products digitally, communicate with customers, and access financial services more efficiently. Additionally, the use of mobile phones enhances financial inclusion, particularly through mobile banking and digital payment services. This enables people who were previously excluded from the conventional banking system to participate in formal economic activities. Thus, more people can save, invest, and conduct financial transactions efficiently, which indirectly increases per capita income.

On the macro side, increased mobile phone access drives efficiency in the public and private sectors. Governments can use this technology to improve public services, increase transparency, and speed up the distribution of social assistance. At the same time, the private sector can leverage improved data and communication to optimize supply chains and

enhance product competitiveness in the global market. Countries that successfully increase mobile phone usage also tend to show an increase in per capita income. This is because this technology acts as a catalyst for innovation and digitalization of the economy, which opens up new jobs in the technology, digital services, and creative economy sectors. Thus, economic development becomes more inclusive and sustainable.

Not only that, but mobile phones also support the growth of a large informal sector in many countries. Through better access to information, informal businesses can develop business networks, seek new market opportunities, and improve operational efficiency. This contributes positively to household income and reduces poverty at the local level. The significant impact of mobile phone use is also seen in education and skills training. With access to the internet through mobile phones, people can obtain information and education remotely, improving job skills relevant to current market needs. These improved skills contribute to increased productivity and income, cumulatively increasing national per capita income.

9) The effect of economic transformation on economic development

Economic transformation is the process of shifting a country's economic structure from traditional sectors, such as agriculture and manufacturing, to more modern and service-based sectors. In the context of ASEAN countries, this transformation is significant as the services sector is now the primary driver of economic growth. The percentage of services to Gross Domestic Product (GDP) indicates the degree to which a country's economy has transitioned from reliance on primary and secondary sectors to a more productive and high-value-added services sector. This shift has a significant impact on economic development as reflected in the per capita income indicator.

This research aligns with Georgescu et al. [54] who found that the service sector has a significant impact on economic development. The services sector encompasses a diverse range of activities, including finance, education, health, tourism, information technology, and other professional services. When the services sector grows and takes up a larger portion of the economy, it usually signals that the country is experiencing an increase in economic efficiency and complexity of economic activities. The services sector often requires a more skilled workforce, advanced technology, and a high degree of innovation, leading to increased productivity and a higher quality of human capital. The growth of the service sector can also significantly increase per capita income. This is because services typically offer greater value-added than traditional agriculture or manufacturing. For example, financial services and information technology can generate much higher income per unit of labor than primary sector jobs. Thus, as the services sector expands, the average income of the population also tends to increase, which is reflected in an increase in per capita income.

This economic transformation towards the services sector also has an impact on increasing global competitiveness. Countries that can develop service sectors, such as information technology, tourism, and financial services, can attract greater foreign investment, expand their service export markets, and create high-quality jobs. All of these factors contribute to sustainable economic growth and enhanced public welfare. However, economic transformation towards services does not happen automatically and without challenges. Many countries must address issues such as education and skills inequality, inadequate infrastructure, and regulations that do not support the development of the services sector. If these issues are not addressed, the increasing percentage of services to GDP will not contribute maximally to increasing per capita income and overall economic development.

In addition, the transformation of the economy, driven by the service sector, also brings about changes in social structure and demographics. For example, urbanization is increasing as the service sector is usually concentrated in big cities. This requires careful development planning so that economic growth does not lead to social problems such as congestion, pollution, and widening income inequality. Thus, economic development resulting from this transformation must be balanced with inclusive social policies. The influence of the services sector on per capita income is also reflected in the country's ability to improve people's quality of life. Improved healthcare, education, and other public services, included in the services sector, can directly enhance welfare. With higher per capita income, people can better access these services, which in turn accelerates human and social development.

10) The influence of infrastructure on economic development

Transportation infrastructure, particularly airport infrastructure and air transport support facilities, plays a crucial role in facilitating mobility and connectivity between regions. Good infrastructure allows an increase in the capacity of air transportation services, which directly impacts the growth in the number of airplane passengers. In the ASEAN context, with the vast territory and economic diversity between countries, this infrastructure is key to facilitating the flow of goods, services, and people.

The study's results indicate that infrastructure with airport passenger volume indicators has a negative impact on economic development in ASEAN. This can be attributed to the fact that increased air mobility in the region reflects greater inequality between countries, with flights concentrated in specific hubs, such as Singapore and Thailand, resulting in an uneven impact. In addition, the increase in passenger numbers is driven more by tourism than by productive economic activities, while limitations in supporting infrastructure, such as logistics connectivity and land transportation, prevent the benefits of air transportation from being optimally distributed. In the short term, the surge in passengers can also give rise to negative externalities, such as pollution and increased dependence on the vulnerable tourism sector, thereby negating its contribution to regional economic development.

In line with research by Becha et al. [63], who explained that the number of air transport passengers can be considered an important indicator reflecting the level of economic activity and regional interaction. An increase in the number of passengers indicates high population mobility, both for business, tourism, and social activities. This increased mobility will encourage more dynamic economic activity, strengthen trade and investment networks, and facilitate the transfer of knowledge and technology between countries. The link between infrastructure and the number of air transport passengers will ultimately contribute to economic development as measured by the per capita income indicator. Adequate infrastructure and good accessibility enable economic actors to conduct business activities more efficiently, thereby increasing productivity and income. Increased per

capita income reflects better economic welfare and the country's ability to provide more optimized public services.

The difference in the level of development of air transport infrastructure is quite significant. Countries with modern airports and extensive flight routes tend to experience faster increases in passenger numbers. This strengthens their position as business and tourism hubs in the region, which in turn has a positive impact on per capita income growth. In contrast, countries with limited infrastructure often experience limitations in encouraging air mobility, limiting the potential for economic expansion. Inadequate infrastructure leads to higher transportation costs and longer travel times, which in turn reduce the country's competitiveness in regional and global markets. Airport infrastructure development also impacts job creation, both directly in the transportation and aviation sectors and indirectly through supporting sectors such as tourism, trade, and services. This employment growth contributes to an increase in people's income, which in turn increases the country's per capita income. In the context of economic integration, improving connectivity through air transportation is crucial. Good infrastructure enables faster and more efficient movement of goods and services, strengthening regional supply chain networks. This supports the growth of the industrial and trade sectors, contributing directly to increased national and per capita income. Additionally, the increase in air transport passenger numbers also drives the growth of the tourism sector, which is a strategic sector for many countries. A thriving tourism sector generates huge foreign exchange, absorbs labor, and increases the income of local communities. All these factors contribute to sustainable economic development and higher per capita income. It is also worth noting that investments in air transportation infrastructure not only generate short-term economic benefits, but also strengthen long-term economic foundations. Strong infrastructure provides attractiveness for foreign and domestic investors, boosts business confidence, and creates a conducive environment for innovation and economic growth.

11) The effect of incentives on development economics

Fiscal incentives such as tax deductions and subsidies play an essential role in spurring economic development. When the government provides incentives in the form of tax reductions minus subsidies, it can increase people's purchasing power and stimulate investment. In the context of ASEAN countries, this strategy has a direct effect on increasing per capita income, due to a more dynamic economic cycle.

This research is supported by Amu et al. [59], who revealed that tax reduction increases the availability of capital for businesses. With a lower tax burden, companies can expand their operations, recruit more staff, and enhance productivity. This has a positive impact on overall economic output, which is then reflected in the growth of people's per capita income. Subsidies provided by the government aim to reduce the cost of production or consumption, making the price of goods and services more affordable. Well-targeted subsidies can increase household consumption and expand access to essential goods and services. Subsidies also help boost specific sectors that are strategic for economic development, such as agriculture, energy, and education. However, if subsidies are too large and not managed efficiently, they can create a significant fiscal burden for the government. Therefore, tax deductions minus subsidies must be carefully designed to avoid disturbing the state budget balance. The effectiveness of these incentives largely depends on how fiscal policy is implemented.

In the framework of economic development, per capita income is an important indicator as it reflects the welfare of the average citizen. Countries that effectively manage fiscal incentives tend to exhibit faster growth in per capita income. This is because incentives can accelerate investment and consumption that drive sustainable economic growth. The significant influence between incentives and taxes minus subsidies can also be seen in a country's economic competitiveness. With the right incentives, the business climate becomes more conducive, attracting FDI. FDI brings in new technology, capital, and jobs that are indispensable for increasing productivity and per capita income. Additionally, tax incentives and subsidies have a multiplier effect that can boost economic activity in the informal sector and Micro, Small, and Medium Enterprises (MSMes). In many countries, this sector is the mainstay of the domestic economy and a source of income for a large proportion of the population. Fiscal incentive support can encourage MSMEs to expand and increase people's income.

However, it is essential to note that the impact of these incentives is not always linear. Other factors, such as the quality of governance, transparency, and fiscal administration capacity, also influence the effectiveness of these incentives in increasing per capita income. ASEAN countries with strong institutions tend to utilize fiscal incentives more optimally. The experience of several countries shows that a combination of tax reductions and subsidies targeted at productive sectors can accelerate the pace of economic development. Thus, this fiscal strategy is an effective policy tool in efforts to increase per capita income and the general welfare of the community. Overall, tax cuts combined with subsidies have a significant impact on economic development. These incentives can stimulate investment, consumption, and productivity, which ultimately increase per capita income and improve the overall well-being of society. However, their success heavily depends on well-planned policies and efficient fiscal management.

5. CONCLUSIONS

This study demonstrates that institutional and structural factors have a significant influence on ASEAN's economic development. Economic institutions, as reflected in access to modern financial services, and political institutions, through the rule of law and control of corruption, have proven to be significant in creating a conducive climate for investment and business activity. This confirms that good governance is an important foundation for strengthening regional economic growth.

Additionally, education, health, innovation, and technology all play a significant role in accelerating economic development. Higher education improves the quality of human resources, health strengthens productivity, while innovation and ICT drive global competitiveness. Economic transformation through the strengthening of the service sector, support for air transportation infrastructure, and fiscal policies in the form of appropriate incentives also encourages more sustainable growth. These factors form a mutually reinforcing development ecosystem.

However, the study also found that FDI has no significant impact on economic development in the ASEAN region. It shows that development does not depend only on foreign capital, but more on strengthening domestic capacity and

institutions. Therefore, development strategies in ASEAN should be directed towards improving the quality of human resources, strengthening institutions, and utilizing technology and innovation as the main pillars for creating inclusive and sustainable economic growth.

6. RECOMMENDATIONS

ASEAN countries need to strengthen their economic institutions by expanding access to digital financial services, such as ATMs and electronic banking services, so that people can conduct transactions and participate in economic activities more easily. Furthermore, strengthening the rule of law must be a priority by enforcing regulations consistently and transparently, while improving anti-corruption mechanisms to ensure that investments and business activities can proceed without obstacles. Higher education needs to be promoted through improving quality and equitable access, particularly by supporting vocational programs and research relevant to labor market needs and technological developments.

In the health sector, the government must increase budget allocation for health services to improve the quality of life and optimize labor productivity. It is also crucial to foster innovation through policies that promote the export of high-tech products and facilitate integrated research and development (R&D) between the public and private sectors.

Improvements in air transportation infrastructure need to be followed by airport modernization and expanded flight networks to strengthen interregional connectivity and positively impact economic activity. In terms of fiscal incentives, the government is advised to design more efficient and transparent tax and subsidy policies to spur economic growth without distorting the market. Finally, although FDI has not been proven to have a significant impact, ASEAN countries still need to improve their investment climate to ensure that foreign investment is more integrated and provides broader benefits for domestic economic development.

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