DIGITALIZATION AND ECONOMIC GROWTH: BUSINESS STRATEGIES IN THE ASEAN MARKET

Sendy Watazawwadu'Ilmi[1], Fuad Wahdan Muhibuddin, Alfa Chasanah, Tanti Novianti

School of Business, IPB University
Jl. Pajajaran, Bogor 16151, Indonesia

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Abstract:

Background: The increasing adoption of digital technologies has initiated a fundamental restructuring of economic landscapes worldwide, including ASEAN. The diffusion of mobile connectivity and expanded internet accessibility has not only reinforced market synthesis but also fostered technical innovation and productivity improvement.
Purpose: This study examines the impact of digitalization, measured by mobile subscription and internet users, on economic growth in ASEAN countries.
Design/methodology/approach: Utilizing a panel dataset comprising 10 ASEAN member countries from 2010 to 2022, this approach facilitated the assessment of the relationship between digitalization and GDP per capita and other control variables, namely trade openness, investment, and inflation.
Findings/Results: The analysis indicates a statistically significant positive correlation between mobile subscriptions and internet users to GDP per capita, underscoring the crucial role of digital connectivity in fostering economic efficiency, market expansion, and innovation. Furthermore, trade openness demonstrates a beneficial effect on economic growth. Conversely, inflation demonstrates a significant negative impact on growth. Investment demonstrates no substantial effect, indicating variations in investment quality and distribution among ASEAN nations.
Conclusion: The findings of this study emphasize the pivotal role of digitalization, and particularly internet penetration, in enhancing economic performance. These findings highlight the need for focused investments in telecommunications infrastructure in order to successfully promote innovation and productivity growth throughout the area.
Originality/value (State of the art): This study contributes to the existing literature by integrating business perspective to offer novel insights into the interplay between digitalization, trade, and economic performance. The findings provide valuable implication for both policymakers and business leaders.

Keywords: ASEAN, business economics, business strategy, digitalization, economic growth

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[1] Corresponding author:
Email: sendywataz@apps.ipb.ac.id

INTRODUCTION

In the aftermath of COVID-19, countries across the globe encountered significant obstacles in reviving their economies. The crisis necessitated accelerated adoption of digital transformation strategies by numerous sectors, particularly businesses, as a means to mitigate economic disruptions and sustain resilience (Mohamed, 2023). Digitalization has emerged as a vital driver of economic growth, enhancing productivity, fostering innovation, and facilitating access to financial services, e-commerce, and broader digital economic interaction (Du & Jian, 2023; Ye et al. 2024).

In the ASEAN region, digitalization has served as a buffer against economic downturns. However, significant differences in digital infrastructure and technology acceptance continue to be challenging. Although ASEAN countries show notable increase in internet penetration and mobile connection (OECD, 2022; World Bank, 2024), the ongoing digital gap prevents fair access to the benefits of digital transformation.

Although an average of 4% annually between 2019 and 2022 the capacity of member nations to utilize digital resources for economic development varies greatly even if internet usage increases. While lower-income countries like Myanmar and Laos face infrastructure constraints and policy limitations, Singapore and Malaysia have effectively involved digital technologies into their economic systems (Amaliah et al. 2024; Hofman et al. 2016; Lin, 2024; Rapih & Wahyono, 2023). This unequal landscape raises important questions on how much digitization contributes to economic development and how fairly its benefits are distributed over the ASEAN area.

Despite growing digital adoption in ASEAN, empirical research remains limited regarding the direct impact of digitalization on economic performance, particularly in connection to corporate efficiency, market development, and innovation. Most of the current research has focused on developed areas including the Middle East (Alfoul & Khatatbeh, 2024; Habibi & Zabardast, 2020), where studies highlight the transforming effect of digital connectivity and enabling integration into global value chains (Ward & Zheng, 2016; Wu & Yu, 2022).

Hofman et al. (2016) conducted research showing how importance ICT adoption is to improving labor productivity and economic performance in developing countries. Similarly, studies have emphasized the role of digital financial inclusion in supporting economic growth and resilience in both advanced and emerging economies (Ahmad et al. 2021; Amaliah et al. 2024; Rapih & Wahyono, 2023). However, there is an absence of comprehensive, region-specific studies focusing on how important metrics, such mobile connection and internet adoption, influence ASEAN's economic dynamics. This research gap necessitates a focused study on how digitalization supports inclusive and sustainable development in the ASEAN.

To address this research gap, this study employs digital proxies such as mobile subscriptions and internet users, which are crucial in determining the degree of digital involvement within an economy. Mobile subscriptions reflect the fundamental telecoms infrastructure and its ability to enable the spread of digital technologies. Particularly in developing regions, recent findings by Rahman et al. (2023) and Khan et al. (2022) confirm the transforming ability of mobile technology in improving entrepreneurial activity and household incomes.

The growing number of internet users also reflects more general to digital connectivity. Research by Muhammad et al. (2024) and Hofman et al. (2016) show how more internet penetration helps companies to adopt creative ideas, increase output, and stay competitive in ever digital markets by means of innovative practices adoption. These digital proxies are therefore appropriate for assessing the role of digitalization in economic transformation and are consistent with empirical frameworks established in prior research.

As one of the world's fastest-growing economic regions (S&P Global Market Intelligence, 2024), ASEAN's economic variety population changes and unequal digital infrastructure create a unique environment for empirical research. Emerging as innovation centers with their vibrant marketplaces and growing digital ecosystems, countries including Indonesia, Vietnam, and Philippines are drawing worldwide interest (GovInsider, 2016).

Within this context, the objective of the present study is to evaluate the extent to which economic development in ASEAN countries influenced by digitalization, as evidenced by mobile subscription and internet penetration. Additionally, the analysis includes other macroeconomic metrics involving investment, trade openness, and inflation to give a comprehensive view

of the interplay between digital and economic aspects. This study aims to provide actionable insights for policymakers and corporate stakeholders in formulating digital policies that promote inclusive and sustainable economic development in the region by addressing existing knowledge gaps.

METHODS

This study investigates how digitalization affects ASEAN countries economic development using panel data analysis. The data used in this study include information from ASEAN countries, with adjustments to variables and periods based on available data. To ensure the universality and novelty of the calculation results, we mainly selected data from countries in ASEAN from 2010 to 2022 as the sample. Data sources were obtained from the World Bank (World Bank, 2024), the International Telecommunication Union (ITU, 2023), and official statistical data from each ASEAN country.

This study employs relevant variables, as summarized in Table 1, to assess the influence of digitalization on ASEAN economic growth. The endogenous variable used is Gross Domestic Product (GDP) per capita, while the exogenous variables include mobile subscriptions and internet users. Additionally, the model includes control variables such as trade value and inflation to address economic openness and price stability. This approach is design to evaluate the contribution of digitalization to economic growth local and regional levels.

The data collection technique used in this study is purposive sampling. This method was chosen to ensure that the selected countries meet specific criteria relevant to the research objectives. The criteria for purposive sampling in this study include ASEAN members countries that have available data for the period from 2010 to 2022. The sample excluded Timor Leste due to insufficient data. This study encompasses 10 ASEAN member countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, Vietnam, Brunei Darussalam, Cambodia, Laos, and Myanmar. The selected timeline aims to document the escalation of digitalization int the region, which accelerated after 2010 owing to the swift expansion of mobile and internet technologies.

Using Stata 17, the model employed in this study is a panel data regression model using either the Fixed Effects (FE) or Random Effects (RE) approach, selected based on the results of the Hausman test to determine the most appropriate model. Panel data provide a larger number of observations compared to cross-sectional data while capturing dynamic effects similar to time series data. More importantly, panel data enable the estimation of robust models that address various forms of omitted variable bias (Deng et al. 2025). This enhances the degree of freedom and reduces multicollinearity among explanatory variables (Baltagi, 2005). According to Gujarati (2012), panel data also enriches empirical analysis and provides greater flexibility in modeling the behavior of units across cross-sectional and time-series contexts. Moreover, panel data allows for the identification and measurement of effects that cannot be adequately addressed when relying solely on either cross-sectional or time-series data. The main analytical model is based on the study by Habibi & Zabardast (2020). Given the limitations of available data, adjustments to variables and periods were made for both models, formulated as follows:

$$GDP_{it} = \alpha + \beta_1 MobileSub_{it} + \beta_2 InternetUsers_{it} + \gamma_1 Investment_{it} + \gamma_2 Trade_{it} + \gamma_3 Inflation_{it} + \varepsilon_{it}$$

In the reference model, the study initially included the broadband variable per 100 persons; however, testing revealed multicollinearity, which could bias the research results. As a consequence, the broadband variable was dropped. Therefore, the ASEAN estimation model meets the BLUE (Best Linear Unbiased Estimator) assumptions (Gujarati, 2012), as evidenced by the absence of multicollinearity effects among variables (Table 2). Furthermore, robustness checks were performed to verify the reliability of the model's estimation results, encompassing normality and heteroscedasticity tests, thereby affirming the model's resilience in adhering to standard econometric criteria.

Hypotheses Development

Using mobile subscriptions and internet users as proxy metrics for digital transformation, this study examines at how digitalization affects economic growth within ASEAN countries. The hypotheses developed in line with a synthesis of earlier studies confirming a favorable correlation between digitization and economic performance.

H1: Mobile subscription has a positive impact on economic growth

Particularly in developing areas marked by growing digital infrastructure, mobile connectivity is generally agreed to be a basic engine of economic progress. Increased mobile subscriptions help to improve communication efficiency, lower transaction costs, and enable greater access to financial services, all of which are vital predictors of economic growth, according to research by Habibi & Zabardast (2020). Additionally, Ward & Zheng (2016) emphasize that increasing mobile penetration promotes productivity gains and increases market access for small and medium-sized businesses (SMEs), so essential components of ASEAN economies.

H2: Internet penetration has a positive impact on economic growth

Internet access enables businesses and individuals to participate in the digital economy, fostering innovation, efficiency, and integration into global value chains. While Wu & Yu (2022) focus on China, their findings indicate that internet penetration accelerates business automation and enhances productivity through e-commerce, digital payments, and knowledge dissemination. Similarly, Hofman et al. (2016) discuss how internet access contributes to economic growth in Latin America by improving market access and facilitating trade. Building upon these concepts, Habibi & Zabardast (2020) emphasize that increased internet penetration can lead to significant improvements in economic performance across various regions, including ASEAN countries.

H3: Investment has a positive impact on economic growth

While investment is traditionally seen as a key driver of growth, its impact depends on the quality and sectoral allocation of capital flows. Niebel (2018) states that effective investments yield economic benefits when complemented by skilled labor and technological readiness, which are crucial for maximizing returns in developing regions like ASEAN. Additionally, studies by Habibi & Zabardast (2020) highlight that targeted investments in digital infrastructure can significantly enhance productivity and foster sustainable economic development within these economies.

Table 1. Variable's Operationalization and Measurement

Variable	Operationalization/measurement	Source
GDP per capita	GDP per capita (lnGDP)	World Bank, International Monetary Fund (IMF)
Mobile subscription	Total number of mobile cellular telephone subscriptions per 100 people in a country	International Telecommunication Union (ITU)
Internet Users	Individuals using the Internet (% of population)	World Bank, ITU
Investment	Gross capital formation (% of GDP)	World Bank
Trade	Ratio of total exports and imports to GDP	World Bank
Inflation	Consumer prices index (annual %)	World Bank, IMF

Table 2. Variable Multicollinearity Test Results on ASEAN Data Estimation

	mobilesub	internetusers	investment	trade	inflation
mobilesub	1.000				
internetusers	0.589	1.000			
investment	-0.155	0.042	1.000		
trade	0.485	0.557	-0.198	1.000	
inflation	-0.177	-0.335	0.178	-0.204	1.000

H4: Trade openness has a positive impact on economic growth

Trade liberalization facilitates technology transfer, enhances business competitiveness, and enables economies to integrate into global markets. Brueckner et al. (2018) found that trade openness positively correlates with GDP growth by allowing countries to benefit from comparative advantages and global supply chains. Additionally, Habibi & Zabardast (2020) emphasize that increased trade openness can lead to greater economic resilience and efficiency, further supporting the notion that trade is a crucial driver of economic growth. Furthermore, Alfoul & Khatatbeh (2024) highlight how digital platforms associated with trade enhance operational efficiency for businesses, reinforcing the argument that trade openness significantly contributes to economic development.

H5: Inflation has a negative impact on economic growth

Inflation erodes purchasing power, increases operational costs, and creates macroeconomic instability, thereby hindering business expansion and economic growth. Habibi & Zabardast (2020) found that elevated inflation rates can significantly deter investment activities, leading to slower economic development. Similarly, Amaliah et al. (2024) emphasize that high inflation negatively impacts consumer spending and business confidence, which are critical for sustained economic growth in ASEAN countries. Furthermore, Rapih & Wahyono (2023) argue that inflation contributes to uncertainty in the market environment, making it challenging for businesses to plan effectively and invest in long-term projects.

Along with considering a set of control factors, the conceptual framework (see Figure 1) defines the interrelationships between digitalization variables and economic growth. In this model, mobile subscriptions and internet users are identified as critical indicators of digitalization, reflecting the extent to which technology is integrated into economic activities. These digitalization variables are hypothesized to positively influence economic growth by enhancing connectivity and facilitating access to information. Additionally, investment, trade, and inflation are included as control variables to provide a more nuanced understanding of their impact on economic performance. By incorporating these elements, the framework aims to comprehensively assess how digital advancements contribute to overall economic development within ASEAN countries.

RESULTS

Trend Analysis of Digitisation Variables

Figure 2 illustrates the GDP growth trends of ASEAN countries from 2010 to 2022, reflecting the region's highly diverse economic dynamics. The early period from 2011 to 2014 shows stable growth in most ASEAN countries, consistent with data indicating an increase in international trade and inflows of foreign direct investment (FDI) into the region (Brueckner et al. 2018; Kien et al. 2023). This growth was further supported by the expansion of the middle class, which positively influenced domestic consumption and private sector investment, thereby driving sustainable economic growth (Brueckner et al. 2018).

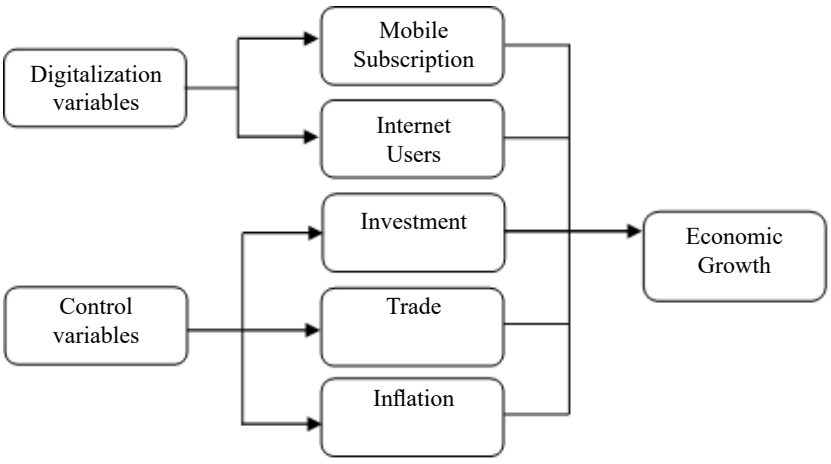

Figure 1. Framework of Thought

However, a significant decline was observed in 2020, directly caused by the COVID-19 pandemic. The pandemic severely impacted global supply chains and led to a sharp downturn in economic activity across various sectors (Gamal et al. 2022; Zaerpour et al. 2023). During this period, the adoption of digital technology increased significantly in response to the need to maintain economic activity amidst social restrictions, reflecting the region's digital transformation (Mohamed, 2023). This suggests that digitalization may not only be a factor in economic growth but also a crucial mechanism for resilience during economic shocks.

Following the sharp decline in 2020, the figure indicates consistent recovery in 2021 and 2022, with most countries experiencing positive growth once again. This recovery was supported by aggressive fiscal and monetary policies, as well as the accelerated digital transformation across various economic sectors (Lukmanova et al. 2024; Mohamed, 2023; Taylor, 2022). Digitalization, particularly in the e-commerce and financial services sectors, played a crucial role in driving the region's economic recovery by improving operational efficiency and expanding markets for local businesses (Ahmad et al. 2021; Suroso et al. 2022).

Figure 3 illustrates the progression of digitalization in ASEAN countries. Nearly all ASEAN countries exhibit very high mobile subscription penetration rates, with figures approaching or exceeding 100% in most nations. This indicates that a majority of the population owns more than one device or mobile subscription. Thailand records the highest penetration rate, reflecting its advanced digital infrastructure and highly developed economy. A study by Gruber & Koutroumpis (2011) and Ward & Zheng (2016) supports this statement, highlighting that high mobile penetration correlates with improved communication efficiency and increased productivity in the economic sector.

Internet users, however, show greater disparity compared to mobile subscriptions. Singapore and Brunei Darussalam lead, with high internet user penetration, reflecting mature digital connectivity in these countries. Xia et al. (2024) and Zheng (2022) note that widespread internet access enables better integration of the digital economy, fostering e-commerce growth and technological innovation.

Conversely, countries such as Myanmar, Laos, and Cambodia have much lower internet user penetration compared to the ASEAN average. The main challenges faced by these nations include inadequate telecommunications infrastructure and relatively high internet access costs (Lambrechts & Sinha, 2019). Low internet penetration often hinders digital inclusion and restricts public access to technology-based services, such as e-commerce and digital financial services (Ananzeh et al. 2025; Dou et al. 2024; Jain & Sahu, 2025; Mothobi & Kebotsamang, 2024).

Indonesia, as one of the largest economies in ASEAN, shows more than half an internet penetration rate, with approximately 67% of its population online, but lags significantly behind countries like Singapore (95%) and Malaysia (97%) in 2022 (World Bank, 2024). This disparity highlights the uneven digital infrastructure in the region. This moderate penetration is attributed to significant urban-rural divides in infrastructure development and internet affordability (Khan et al. 2022). Suroso et al. (2022) emphasize that addressing such disparities through inclusive policies and infrastructure investment is crucial for unlocking Indonesia's digital economic potential.

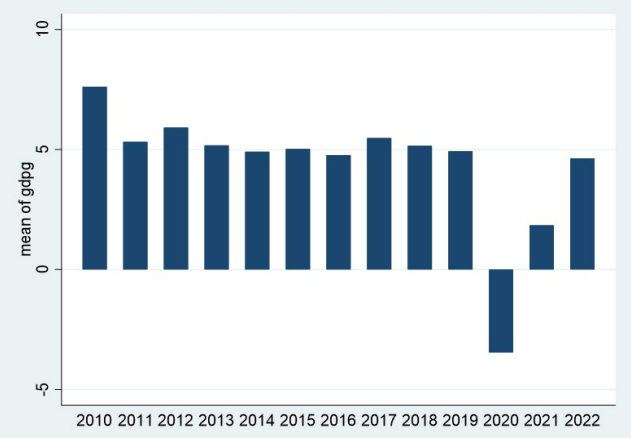

Figure 2. GDP growth of ASEAN countries

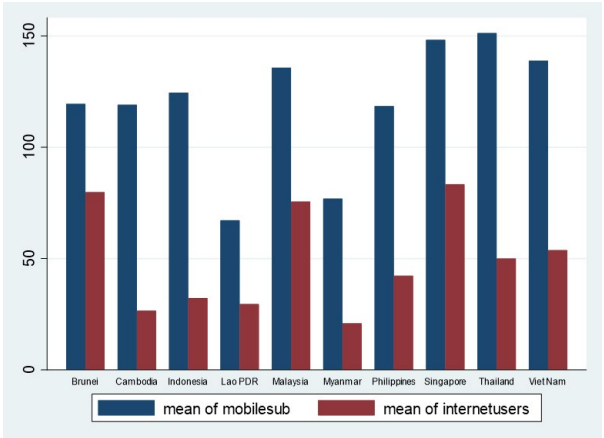

Figure 3. Digitalisation Growth of ASEAN Countries

The Effect of Digitalisation on Economic Growth (GDP) of ASEAN Countries

This section analyzes the results of testing the independent variables: mobile subscription, internet users, investment, trade, and inflation against the dependent variable, GDP per capita, in ASEAN countries. Table 3 provides a comprehensive statistical summary of the variables used in analyzing the impact of digitalization on economic growth in ASEAN countries. Descriptive statistics offer valuable insights, forming the basis for interpreting empirical results and understanding regional economic trends. From a business perspective, the summary highlights key economic factors influencing the operating environment and strategic decision-making across ASEAN countries.

The GDP growth rates across ASEAN countries are varied, with an average logged GDP (lnGDP) of 8.50%. This indicates significant variation in economic growth rates across ASEAN nations, reflecting differing stages of development and economic diversification. For businesses, this variance underscores the importance of tailoring market strategies to country-specific conditions, leveraging growth opportunities in high-performing economies while addressing structural challenges in lower-growth nations.

The mobile subscriptions variable, averaging 120.01 per 100 people, indicates that some countries have more than one subscription per individual. However, the range between the minimum value of 1.20% and the maximum value of 181.77% reveals significant disparities in communication access. Businesses reliant on mobile platforms, such as e-commerce or fintech, must consider these disparities when designing market penetration strategies, focusing on expanding access in underserved areas to unlock untapped potential. Research by Gruber & Koutroumpis (2011) and Xia et al. (2024) highlights how mobile connectivity can drive efficiency and foster innovation in digital business models.

The internet users variable indicates an average of approximately 49.44% internet penetration in ASEAN countries, with a considerable disparity reflected by a standard deviation of 28.24. Additionally, the difference in internet penetration is pronounced, with the minimum and maximum values showing that some countries have nearly 0% internet penetration, while others reach nearly 99%. This disparity poses challenges for businesses dependent on digital engagement, such as online retail or digital financial services. Wu & Yu (2022) note that greater internet penetration supports productivity growth and enables businesses to innovate, particularly in regions with strong connectivity. Closing the digital gap through investments in digital infrastructure could enable more equitable business opportunities and drive regional economic integration.

The average investment-to-GDP ratio among ASEAN countries is 28.12%, reflecting diverse strategies in investment allocation, with a minimum value of 17.10% and a maximum of 41.07%. However, the disparity in investment allocation highlights the need for policy alignment to ensure that investments target sectors critical to digital transformation, as Niebel (2018) and Powell & Macera (2017) suggest that the quality and direction of investments are essential for maximizing economic and business impacts.

Table 3. Descriptive Statistics of ASEAN Countries

Variable	Obs	Mean	Std. dev.	Min	Max
lnGDP	130	8.50	1.26	6.74	11.13
mobilesub	130	120.01	34.92	1.20	181.77
internetusers	130	49.44	28.24	0.25	98.97
investment	130	28.12	5.42	17.10	41.07
trade	130	119.87	84.30	11.86	379.10
inflation	130	3.35	3.21	-1.26	22.96

Trade openness, with an average ratio of 119.87%, underscores ASEAN's interconnected markets and integration into global value chains. The variation in trade strategies across countries is significant, as evidenced by a minimum value of 11.86%, suggesting low trade openness, and a maximum value of 379.10%, reflecting very high trade openness. Alfoul & Khatatbeh (2024) emphasize that trade liberalization facilitated by digital platforms can enhance competitiveness and operational efficiency for businesses operating in the region.

The average inflation rate among ASEAN countries stands at 3.35%, although macroeconomic challenges persist in certain nations, as highlighted by a maximum inflation rate of 22.96% that poses risks to business stability by eroding purchasing power and increasing input costs. Osipov (2020) and Panova et al. (2024) highlight the importance of macroeconomic stability in creating a conducive environment for sustainable business growth, particularly in regions undergoing digital transformation.

The testing was conducted by first analyzing the data using the ordinary least squares (OLS), panel fixed effect, and panel random effect. The results from all three tests indicate that most variables have an influence on GDP per capita (Table 4). The estimation results were tested to select the best estimation model using the Hausman Test (see Table 5), which yielded a probability value of 0.000, indicating that the fixed effect model is the most suitable.

The fixed effect estimation results in Table 4 indicate that the variable mobile subscription has a positive and significant effect at the 10% level, with a coefficient value of 0.001. This implies that a 1% increase in mobile subscriptions per 100 people will raise GDP per capita by 0.1%. Another digitalization factor, internet users, also shows a positive effect on GDP per capita, with a coefficient of 0.005 at the 1% significance level. This indicates that a 1% increase in internet users will increase GDP per capita by 0.5%.

Table 4. Mobile Subscription, Internet Users, Investment, Trade, and Inflation in the ASEAN Countries' Economy

Variable	Model 1	Model 2	Model 3
	OLS	Fixed Effect	Random Effect
mobilesub	-0.003	0.001**	0.001*
	(0.002)	(0.000)	(0.000)
internetusers	0.022***	0.005***	0.005***
	(0.003)	(0.001)	(0.001)
investment	0.029**	0.002	0.001
	(0.011)	(0.003)	(0.003)
trade	0.006***	0.001*	0.002***
	(0.001)	(0.001)	(0.001)
inflation	-0.083***	-0.011***	-0.012***
	(0.019)	(0.003)	(0.003)
cons	6.414***	8.041***	7.959***
	(0.395)	(0.084)	(0.189)
R-squared	0.753	0.661	0.714
No of countries	10	10	10
No of observation	128	128	128

Standard errors are in parentheses. *,**,*** denote significance at 1%, 5% and 10% levels

Table 5. Hausman Test Result

	Chi-square	Prob.
Hausman Test	38.75	0.000

The estimation results for the control variable investment indicate a positive effect with a coefficient of 0.002, though it is not statistically significant. Furthermore, the variable trade has a positive effect on GDP per capita, with a coefficient of 0.001 at the 10% significance level. This suggests that a 1% increase in export-import activities will increase GDP per capita by 0.01%. On the other hand, inflation has a negative effect on GDP, with a coefficient of -0.011 at the 1% significance level. This indicates that a 1% increase in inflation will reduce GDP per capita by 0.1%. The estimation results also reveal an R-squared value of 0.661, indicating that 66.1% of the variation in GDP per capita can be explained by the independent variables in this model.

The fixed effect model results reaffirm digitalization's significant impact on economic growth in ASEAN, particularly through mobile subscriptions and internet penetration. These findings reinforce the role of telecommunication infrastructure and digital access as critical enablers of business productivity, operational efficiency, and innovation, consistent with prior research (Gruber & Koutroumpis, 2011; Habibi & Zabardast, 2020; Ward & Zheng, 2016; Zheng, 2022). However, this research uniquely emphasizes the dynamics of digital disparities, specifically within ASEAN countries. By concentrating on this region, the study provides valuable insights into how digitalization can be leveraged to enhance economic growth amidst varying levels of access and infrastructure across member states.

The positive and significant relationship between mobile subscriptions and GDP per capita (coefficient value of 0.001 at the 10% significance level) highlights the importance of telecommunication infrastructure in reducing transaction costs and improving market efficiency, as demonstrated by Ward & Zheng (2016). For businesses, particularly small and medium enterprises (SMEs), mobile technology serves as a low-cost entry point to digital platforms, enabling broader market participation. Furthermore, Internet users, as a proxy for digital connectivity, demonstrate an even greater positive impact on GDP per capita (coefficient value of 0.005 at the 1% significance level). This reinforces the role of internet access in enabling businesses to innovate, expand their reach, and streamline operations. Wu & Yu (2022) emphasize that widespread internet access supports the automation of processes and integration into global value chains, which is particularly beneficial for e-commerce businesses. Mohamed (2023) underscores how the rapid adoption of internet-based solutions during the COVID-19 pandemic catalyzed recovery efforts, enabling businesses to maintain continuity despite disruptions.

From these two variables, there is a significant magnitude difference between mobile subscriptions and internet users in influencing GDP per capita. The coefficient for internet penetration (0.005, p<1%) is notably higher than mobile subscriptions (0.001, p<10%), suggesting that internet access plays a stronger role than mere mobile ownership in driving economic output. This finding builds upon and extends previous research (Habibi & Zabardast, 2020; Wu & Yu, 2022), which primarily emphasized the role of mobile connectivity without differentiating its relative impact compared to internet penetration. By highlighting this distinction, this study underscores the importance of policy interventions that prioritize broadband infrastructure development rather than merely expanding mobile connectivity, ensuring that businesses and individuals can fully leverage the economic benefits of digital transformation.

The investment variable, while positive, is not statistically significant. This suggests that the effectiveness of investments in promoting economic growth depends heavily on their quality and alignment with business needs. This finding aligns with Niebel (2018) who argues that ICT investments yield substantial economic returns only when coupled with technological readiness and workforce education. Similarly, Zhu et al. (2016) emphasize that investment impacts are maximized when supported by strong infrastructure and coherent policies. For businesses, this indicates the need for targeted investments in digital infrastructure and skills development to fully leverage digitalization and enhance competitiveness.

Trade openness shows a positive and significant relationship with GDP (coefficient value of 0.001 at the 10% significance level), highlighting its role in facilitating technology diffusion and enhancing business competitiveness. Digital transformation has revolutionized trade dynamics in ASEAN, allowing businesses to access broader markets and optimize supply chains. Alfoul & Khatatbeh (2024) note that digital trade platforms enhance operational efficiency and reduce costs, making ASEAN businesses more competitive globally. Open trade policies accelerate

technology adoption, benefiting businesses through knowledge exchange and improved productivity (Alfoul & Khatatbeh, 2024; Brueckner et al. 2018). This finding underscores the importance of fostering regional trade agreements that prioritize digital integration and innovation.

Conversely, inflation negatively impacts GDP, with a coefficient value of -0.011 at the 1% significance level. This reflects its destabilizing effect on economic and business activities. The finding also gives the clear interaction between inflation and digital transformation, where countries with high inflation experience weaker digitalization benefits. High inflation erodes purchasing power, increases input costs, and creates uncertainty, deterring both consumer spending and business investments. Amaliah et al. (2024) and Panova et al. (2024) link inflation stability to a conducive business environment, while Rapih & Wahyono (2023) highlight that ASEAN countries with controlled inflation tend to experience more stable economic growth. For businesses, stable inflation rates provide predictability, fostering long-term planning and investment. Maintaining price stability is necessary to fully capitalize on digitalization's economic benefits.

Managerial Implication

The findings of this study emphasize several key managerial implications for businesses in the ASEAN region. First, the strong positive impact of digitalization on economic growth highlights the need for businesses, particularly SMEs, to adopt digital tools and platforms, such as mobile technology and internet-based applications, to enhance efficiency, expand market reach, and foster innovation. Trade openness also presents significant opportunities for businesses to integrate into global markets, optimize supply chains, and enhance competitiveness through technology transfer. Additionally, the negative impact of inflation on economic growth underscores the importance of developing strategies to manage inflationary pressures, such as cost optimization and financial risk management. Finally, businesses operating in less digitally developed ASEAN countries must invest in localized digital strategies and collaborate with policymakers to advocate for improved digital infrastructure and inclusive policies. By aligning managerial strategies with these findings, businesses can strengthen their competitive position in the ASEAN region and capitalize on the opportunities presented by digitalization and trade openness.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study reaffirms that digitalization significantly impacts economic growth in ASEAN, with internet penetration demonstrating a stronger effect than mobile subscriptions. The results highlight the essential role of telecommunication infrastructure and digital access as critical enablers of business productivity, operational efficiency, and innovation. These findings align with prior research (Gruber & Koutroumpis, 2011; Habibi & Zabardast, 2020; Ward & Zheng, 2016), while also emphasizing the uneven nature of digital transformation across the region. This unevenness suggests that addressing disparities in internet access is vital for fostering inclusive growth within ASEAN economies.

From a theoretical standpoint, this study contributes to digital economic literature by clarifying the distinct roles of mobile and internet connectivity in fostering economic development. Practically, the findings offer critical implications for policymakers and businesses. Governments should prioritize internet infrastructure, develop policies that encourage digital adoption, and ensure trade policies that support technology transfer. Businesses must leverage digital tools to enhance operational efficiency and expand market reach. By addressing these structural challenges, ASEAN countries can harness digitalization to drive long-term competitiveness and inclusive economic growth.

Recommendations

Future research should consider incorporating additional variables such as e-commerce growth, human capital development, and regulatory frameworks to provide a more comprehensive understanding of their collective impact on economic growth. Expanding the scope beyond ASEAN to include other emerging economies could yield valuable insights into how digitalization influences economic resilience and competitiveness across different regions. Additionally, examining the long-term effects of digitalization on market access and economic stability during crises would enhance our understanding of these dynamics in a global context.

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