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Quantifying Internet's Economic Effects on Consumption: A Southeast Asian Study Using Econometric Models

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KEYWORDS

Consumption,
FEM,
Internet,
REM,
Southeast Asian Economy.

ABSTRACT

This study investigates the economic effects of internet usage on consumption patterns in five Southeast Asian countries – Vietnam, Singapore, Thailand, Indonesia, and Malaysia – over the period from 1996 to 2023. Utilizing panel data regression techniques, including Fixed Effects Model (FEM), Random Effects Model (REM), and Driscoll-Kraay standard errors, the analysis is based on data sourced from the World Bank (2025). The findings reveal that internet usage positively influences consumption, achieving statistical significance at the 5% level. Economic growth demonstrates a strong positive correlation with consumption at the 1% significance level, while trade openness exhibits a negative impact at the 10% level. These results underscore the necessity of improving digital infrastructure, refining regulatory frameworks, and strengthening cybersecurity to boost consumption. Based on the theoritical and empirical basis, the study points to increased consumer demand as a key driver for macroeconomic policy. The importance of this research is heightened by the rising prominence of the digital economy globally, especially in the aftermath of the COVID-19 pandemic. As Southeast Asia emerges as a pivotal economic region, the study offers crucial insights for policymakers aiming to leverage internet expansion for sustainable economic progress.

1. Introduction

The internet greatly influences economic engagement and household interactions in the digital era, presenting both opportunities and challenges. The internet has revolutionized economic participation and household interactions, presenting both benefits and challenges. It improves connection, facilitates e-commerce, and offers enterprises novel platforms. It provides households with convenience, product accessibility, and integration into the digital economy. Nonetheless, obstacles encompass enhanced technological facilities, regulatory frameworks, and digital disparities. Policymakers must confront these issues to optimize advantages and guarantee sustainable economic development. The internet provides a diverse array of goods and services, yet it also presents concerns associated with digital divisions.

The research analyzed the internet's growth, signifying a worldwide trend toward digital integration across multiple sectors. The internet's expansion is linked to economic growth (Haini, 2020; Mulenga & Mayondi, 2022; Wahab et al., 2020), labor productivity (Baker et al., 2020; Varlamova & Larionova, 2020), trade activities (Clarke & Wallsten, 2006; Duan & Hu, 2024; Meijers, 2014), economic sustainability

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(Salahuddin et al., 2016) and household consumption (Bhattacharya et al., 2021; Chunfang et al., 2023; Ma et al., 2020).

The swift rise in internet penetration, surpassing 30% over the last decade, highlights the substantial growth of digital connection in Southeast Asia. The economic landscape of Southeast Asia is rapidly changing, with digital economies assuming a crucial role in growth and development. The digital surge has transformed consumer purchasing behaviors in households, especially within this economic region (Bhattacharya et al., 2021). These countries exemplify the digital revolution, supported by strong internet infrastructure and high adoption rates (Haini, 2020).

Current research is deficient in thorough evaluations that quantify the economic impact of the internet on consumption, particularly in Southeast Asia. This study investigates the positive correlation between internet growth and household consumption in the area. Empirical evidence underscores the advantageous correlation between internet access and enhanced economic growth, offering critical insights for policymakers and corporate leaders. The rapid growth raises a compelling question: How does the increase in internet access affect household consumption behaviors in Southeast Asia? The economic influence of the internet on consumption is intricate and significant, especially in developing regions where digital infrastructure is swiftly progressing.

The study examines the effect of rising internet usage on consumption by households in five Southeast Asian nations—Vietnam, Singapore, Thailand, Indonesia, and Malaysia—from 1996 to 2023. The rationale for choosing these countries is diverse. As integral members of ASEAN, they collaborate on regional policy and economic integration projects that enable comprehensive comparative study, ensuring patterns mirror broader regional dynamics. Secondly, the sample encompasses a varied assortment of economic profiles: Singapore epitomizes a high-income, technologically advanced economy, whereas Vietnam, Thailand, Indonesia, and Malaysia are emerging economies undergoing swift digital adoption, thus reflecting a broad spectrum of consumer reactions to internet expansion. The notable discrepancies in digital transformation rates among these nations create a distinct backdrop for analyzing the differing effects on consumption behavior. The availability of substantial and dependable panel data from respected sources such as the World Bank (2025) facilitates robust econometric modeling. This study is highly relevant to policy as it provides insights into how improved digital infrastructure, regulatory enhancements, and cybersecurity initiatives could strengthen domestic consumption and promote economic growth. This research focuses on Vietnam, Singapore, Thailand, Indonesia, and Malaysia, thereby encompassing a range of economic structures and levels of digitization, while ensuring that the insights obtained are pertinent to policymakers seeking to leverage the advantages of the digital economy.

The study employs econometric models, including Pool-OLS, REM, FEM, and the Driscoll-Kraay method, to analyze the extensive economic ramifications of digital expansion in emerging economies. The main objective is to evaluate the economic effects of internet proliferation on household consumption, emphasizing the internet's capacity to facilitate economic enhancement. This study substantially advances academic knowledge by improving the comprehension of consumption-driven economic patterns in Southeast Asia. Moreover, it provides critical insights for policymakers and corporate leaders, emphasizing the benefits of heightened consumption and its contribution to economic growth in the digital era.

2. Literature review

2.1. Theoretical basis

To analyze the impact on consumption of the internet in Southeast Asia, it is first necessary to understand basic concepts such as the Theory of Consumer Behavior and Network Externalities Theory. The Theory of Consumer Behaviour by Michael and Becker in 1973 analyzes decision-making regarding resource allocation and concludes that digital access influences utility maximization. The Network Externalities Theory, proposed by Katz and Shapiro in 1985, proposes that the value of a product increases with an expansion in its consumer base, a concept particularly relevant to internet-enabled consumption. Consumption patterns are affected by the widespread adoption of the internet, which improves consumer experiences and market reach.

The convenience and access to information offered by digital consumerism is another key factor of the internet's influence, as more and more consumers are turning to digital platforms for buying. E-commerce, or online shopping, has brought about a change in the retail systems, and there is an increase in online consumption. Digital inclusion describes the role of universal access to the internet in modifying consumption patterns through the reduction of economic disparities (Chunfang et al., 2023). (Ma et al., 2020) also focus on the digital divide and notes that lack of technology in rural areas may worsen economic inequalities. Both studies are quite insistent on the importance of equity in internet access for equitable economic development.

The relationship between these theories and concepts is evident. The consumer behavior within the digital economy is shaped by the network effects stemming from internet penetration and the presence

of e-commerce platforms. The rise in internet usage contributes to the expansion of digital consumerism and the growth of e-commerce. It is essential to address the digital divide in order to maximize the economic advantages associated with the expansion of the internet. It is essential for policymakers and business leaders to comprehend these dynamics.

2.2. Literature review

The emergence of the internet has significantly transformed economic landscapes globally, including in Southeast Asia. Multiple empirical research have evidenced the beneficial effect of internet development on the economic activities of nations globally. (Haini, 2020) examined the impact of tourism and internet penetration on economic growth in ten ASEAN nations from 1999 to 2017, concluding that both tourism and internet usage positively affect economic growth, albeit the extent of this effect varies according to each country's level of economic development. (Mulenga & Mayondi, 2022) utilized Panel-Vector Auto-Regression (P-VAR) and Fixed Effects models to assess the influence of digital services trade on the GDP of a panel comprising developing, emerging, and developed nations from 2005 to 2019. Digital services exports substantially boost GDP in all country categories, with a 1% rise in internet usage resulting in GDP improvements of 0.62%, 0.75%, and 0.02% for developed, emerging, and poor nations, respectively. (Wahab et al., 2020) analyzed Southeast Asia from 1997 to 2013 with a Panel Autoregressive Distributed Lag (ARDL) model, and substantiated the positive and large impact of internet users on economic growth, aligning with endogenous growth theory. These research exhibited a strong long-term association between internet usage and economic growth, consistent with economic theories in the realm of macroeconomics.

In the context of trade activities, (Meijers, 2014) and (Clarke & Wallsten, 2006) both emphasized the significance of internet access in facilitating trade, especially in developing nations. Additionally, (Clarke & Wallsten, 2006) discovered that increased internet usage enhances exports from underdeveloped countries to rich nations. (Duan & Hu, 2024) further examined how internet connectivity enhances exports by mitigating risks, particularly benefiting exports to high-risk nations and involving high-risk products.

Regarding labor productivity, (Baker et al., 2020) examined the mediating role of internet usage in the correlation between human capital and labor productivity across 65 developing nations from 2000 to 2014, revealing substantial mediation effects. (Varlamova & Larionova, 2020) confirmed that heightened internet usage correlates with increasing labor productivity in Russia from 2010 to 2018.

On the other hand, the research conducted by (Salahuddin et al., 2016) on OECD nations from 1991 to 2012 demonstrated that while internet usage is positively correlated with CO2 emissions, the effect is negligible, suggesting that the expansion of the internet does not significantly compromise environmental sustainability.

From these studies, the complexities and different effects of the internet expansion across various economic contexts are and presented, regions together with the positive effects of internet development on economic factors such as growth, trade, and labour productivity.

At the same time, in certain empirical studies, the positive influence of growth of the internet on the consumption of households in the Asian region has been demonstrated. The China Family Panel Studies provided by (Chunfang et al., 2023) demonstrate that household consumption expenditure is substantially increased by Internet usage. These findings are confirmed by robustness checks across various demographics and regions. Researchers examining rural China have determined that Internet usage enhances household consumption, hence augmenting purchasing power through increased household income. (Bhattacharya et al., 2021) highlight the divergent impacts of Internet access on energy poverty determinants from 1980 to 2019, with the ASEAN+6 region seeing the Internet increasing electricity consumption. In a similar way, (Ma et al., 2020) investigated the effects of internet access on income and expenditure of rural households in China and found significant positive effects which are more likely to be present among higher income households. The findings suggest that digital finance enhances consumption, especially within lower-income households, via mechanisms including online purchasing and digital payments.

The findings from these studies collectively demonstrate the significant impact of internet use and digital finance on consumption behaviors and overall economic well-being. The significance of internet usage in fostering economic growth is highlighted, especially in rural regions and within lower-income households. The continuous investigation in this domain offers significant understanding for Southeast Asian nations as they strive to leverage the economic advantages of Internet growth from 1996 to 2023. Drawing from the aforementioned theoretical and empirical foundations, the author proposes the subsequent research hypotheses:

H1: Internet growth has a positive impact on household consumption in some Southeast Asian countries.

3. Methodology

The research used a systematic panel data

econometric methodology to evaluate the correlation between internet usage and household consumption. Firstly, unit root tests are performed on all variables to ascertain stationarity, hence confirming their appropriateness for regression analysis. Secondly, cointegration tests are conducted to ascertain the presence of long-term equilibrium relationships among the variables, hence validating the dynamic model definition. Subsequently, a dynamic panel data regression model is developed, including a lagged dependent variable to account for the persistence in consumption. The principal explanatory variables are meticulously chosen based on theoretical significance and first empirical data. Thirdly, t he estimator employs both Fixed Effects and Random Effects Models, supplemented by Driscoll-Kraay robust standard errors to mitigate potential autocorrelation and cross-sectional dependence concerns. Finally, thorough diagnostic tests and parameter stability evaluations are conducted to ensure the model's robustness and reliability. This methodical framework rigorously analyzes the relationship between the internet usage and consumption behavior in Southeast Asia.

3.1. Data

This research focuses on quantifying the economic impacts of internet access on consumption patterns in Southeast Asia, utilizing a thoroughly assembled panel dataset derived from World Bank data (2025). This study examines five countries in Southeast Asia: Vietnam, Singapore, Thailand, Indonesia, and Malaysia, covering the timeframe from 1996 to 2023. The selection process is influenced by the accessibility and dependability of data throughout the specified timeframe, facilitating a comprehensive examination of the internet's effects on economic consumption trends within the region.

The selection of the data collection period commencing in 1996 was a deliberate decision, influenced by the absence of extensive internet usage data in numerous countries before this time frame. Furthermore, the conclusion of 2023 corresponds with the most recent data, offering a current viewpoint on the economic effects being examined. The study concentrates on specific variables and a defined timeframe, intending to address current gaps in the literature. It seeks to provide insights into causal relationships and support informed policy-making aimed at promoting economic growth through internet development in Southeast Asia.

The study integrates essential variables that are fundamental for econometric analysis, including consumption (final consumption expenditure), individual using the internet (% of population), economic growth rate (GDP growth), and trade openness (total trade). The selection of these variables was conducted with great care to accurately reflect the intricate relationship between the expansion of the internet and economic factors. The incorporation of internet usage as a socioeconomic variable facilitates a comprehensive analysis of its impact on consumption behaviors.

3.2. Research model

This study uses the framework of (Khin et al., 2023) to examine the economic impacts of internet usage on household consumption in Southeast Asia. The model is adapted to focus on the relationship between internet penetration and consumption patterns, considering network externalities and consumer behavior. Increased internet usage is postulated to enhance economic connectivity, drive e-commerce activities, and stimulate consumption. The model also incorporates a lagged dependent variable to capture inertia in consumption behavior. Additionally, macroeconomic controls such as GDP growth and trade openness are included to capture broader economic conditions that may influence consumption dynamics. The model is based on its clear formulation, methodological rigor, and ability to control for heterogeneity across countries.

The justification for utilizing the research framework of (Khin et al., 2023) is twofold. The original model's effective management of cross-sectional heterogeneity and temporal dynamics offers a solid empirical foundation for development. Secondly, the incorporation of essential explanatory factors in their model—initially utilized in the realm of renewable energy consumption—exhibits conceptual similarities with the determinants of consumption behavior in a digital economy. Consequently, the modification of their methodology to examine the impact of internet usage on household consumption is both conceptually sound and methodologically beneficia.

In light of these considerations, the econometric specification of this study is formulated as follows:

$$\mathbf{CONSUMPTION}_{i,t} = \beta_0 + \beta_1 \mathbf{CONSUMPTION}_{i,t-1} + \beta 2 \mathbf{INTERNET}_{i,t} + \beta_3 \mathbf{GROWTH}_{i,t} + \beta_4 \mathbf{TRADE}_{i,t} + \mu_{i,t}$$

Where i represents the country; t denotes the year; β0 is intercept or constant; β signifies coefficient or slope and μ denotes error term.

Table 1 provides the definitions and information regarding the variables within the specified research model.

3.3. Research methods

3.3.1. Panel data analysis

The choice of using panel data analysis in this study on the economic effects of internet usage

Table 1. Variable information

Symbol	Definition of Variable	Measurement	Empirical basis	Expected effects
CONSUMPTION	Total household consumption	Annual growth rate of final household expenditure	(Khin et al., 2023; Chunfang et al., 2023)	
INTERNET	Internet growth	Individual using the internet (% of population)	(Khin et al., 2023; Chunfang et al., 2023; Mulenga & Mayondi, 2022)	+
GROWTH	Economic growth rate	Annual growth rate of GDP	(Khin et al., 2023; Meijers, 2014; Mulenga & Mayondi, 2022)	+
TRADE	Trade openness	Ratio of total exports and imports to GDP (Trade - % of GDP)	(Khin et al., 2023; Meijers, 2014)	-

Table 2. Panel Unit Root Test

	Levin, Lin, and Chu		ADF - Fisher Chi-square	
Variable	Level	I(1)	Level	I(1)
CONS	-6.22558***	-14.7032***	50.3785***	128.469***
INTERNET	0.17541	-1.73806**	9.59638	25.3892***
GROWTH	-8.16107***	-18.0271***	67.5159***	146.217***
TRADE	-0.77156	-10.5971***	9.23772	78.8975***

Note: *, **, *** significant at 10%, 5% and 1%, respectively.

on consumption in Southeast Asia is grounded in its methodological strengths. Panel data, which encompasses both cross-sectional and time-series dimensions, is particularly advantageous in this context for several reasons. First, it allows us to address heterogeneity (Gujarati & Porter, 2009) across the five countries studied - Vietnam, Singapore, Thailand, Indonesia, and Malaysia - by capturing specific characteristics and variations over the period from 1996 to 2023. This capability is crucial given the diverse economic environments and internet adoption rates in these nations.

Also, panel data provides a richer dataset that enhances the precision of econometric models (Gujarati & Porter, 2009). It offers more variability and reduces collinearity issues among the key variables (Gujarati & Porter, 2009) - consumption expenditure, internet usage, GDP growth, and trade openness - thereby increasing the degrees of freedom and efficiency of the estimates. This is essential for accurately capturing the complex relationship between internet proliferation and consumption patterns.

In addition, panel data's recurrent cross-sectional observations make it well-suited for analyzing dynamic changes over the 27-year timeframe, enabling a deeper understanding of long-term trends and causal relationships that are less discernible in simple cross-sectional or time-series analyses (Gujarati & Porter, 2009). By employing econometric techniques such as FEM, REM, and Driscoll-Kraay, this study leverages the full potential of panel data to explore and quantify the economic impact of internet usage on consumption behaviors in Southeast Asia, thereby providing robust insights for policy-making.

3.3.2. Panel Unit Root Test

In the context of time series analysis, the identification of unit roots signifies the existence of a stochastic trend. This phenomenon can result in regression outcomes that are not dependable, including exaggerated R-squared values and unpredictable model performance (Gujarati & Porter, 2009). In order to investigate these potential issues, we conducted unit root tests to assess the stationarity of the series. If a series is stationary at its level, it's categorized as I(0); if stationary after first differencing, I(1); and after second differencing, I(2). The hypotheses for our unit root tests are defined as follows:

H0: Every time series shows the presence of a unit root (significance p-value > 0.05).

H1: Every time series exhibits stationarity. (significance p-value ≤ 0.05).

The tests were applied to the panel data concerning the ASEAN-5 countries, focusing on variables including CONSUMPTION, INTERNET, GROWTH and TRADE. At the level, all variables exhibit stationarity, with the exception of real INTERNET and TRADE. Subsequent to the first differencing, all variables exhibit stationarity. The findings indicated that the variables displayed non-uniform stationarity levels, which requires additional cointegration testing. This approach ensures that our econometric models yield robust and reliable results for analyzing internet's economic impact on consumption. The outcomes of our stationarity and cointegration tests are detailed in Table 2.

3.3.3. Panel Cointegration Test

Table 3. Panel Cointegration Test

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	115.2	0.0000	69.67	0.0000
At most 1	59.58	0.0000	27.54	0.0021
At most 2	44.67	0.0000	25.15	0.0051
At most 3	45.59	0.0000	45.59	0.0000

Table 4. Descriptive Statistics of Variables

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
CONSUMPTION	4.670194	4.918285	14.45141	-9.97514	3.355396	140
INTERNET	40.2461	36.4	97.6927	0.000135	31.29767	140
GROWTH	4.549026	5.080659	14.51975	-13.1267	3.645237	140
TRADE	166.1845	132.9364	437.3267	32.97218	105.1859	140

In the context of econometric analysis, the evaluation of stationarity is essential for ensuring the reliability of modeling outcomes. Stationary time series play a crucial role in preventing spurious regressions, especially in the context of examining long-term economic relationships (Gujarati & Porter, 2009). Considering the differing levels of stationarity, we take on a cointegration analysis to find possible long-term relationships among the variables. This analysis is performed utilizing methodologies such as Pedroni, Kao, or Engle-Granger, which are appropriate for contexts involving panel data. The hypotheses regarding cointegration are articulated as follows:

H0: There is no cointegration among the time series ($\alpha > 0.01$).

H1: Cointegration exists among the time series ($\alpha \leq 0.01$).

The results presented in Table 3. demonstrate notable cointegration at both the 0.01 and 0.05 significance levels among the variables for the five Southeast Asian countries. The findings highlight the existence of maintaining equilibrium relationships, thus validating the robustness of our econometric models in clarifying the economic effects of internet usage on consumption.

3.3.4. Panel Model

This research utilizes various econometric methods specifically designed for panel data to evaluate the economic effects of internet usage on consumption in five Southeast Asian countries: Vietnam, Singapore, Thailand, Indonesia, and Malaysia. The methodological framework employed encompasses the Pooled Ordinary Least Squares (POLS), Fixed Effects Model (FEM), and Random Effects Model (REM), with each model offering distinct benefits in the analysis of data variations.

The Hausman test is employed to determine the most suitable model, providing a statistical foundation for the selection between Fixed Effects Model (FEM) and Random Effects Model (REM). Furthermore, the implementation of Driscoll-Kraay standard errors is employed to address concerns related to heteroskedasticity and autocorrelation, thereby enhancing the robustness of the estimations. This methodology is crucial for identifying potential biases and improving the reliability of our findings regarding the long-term economic impacts of internet proliferation in the study area.

4. Research results and discussion

4.1. Summary of descriptive statistics

This study employs data obtained from the World Bank (2025) to analyze critical variables within the research framework, specifically final consumption expenditure (CONSUMPTION), internet usage as a percentage of the population (INTERNET), GDP growth rate (GROWTH), and trade openness (TRADE).

The data illustrated in Table 4. indicates that the mean final consumption expenditure for the five Southeast Asian countries from 1996 to 2023 is roughly 4.67, accompanied by a standard deviation of 3.36. The internet usage rate demonstrates a mean value of 40.25%, accompanied by a considerable variation, as evidenced by a standard deviation of 31.30%. The average GDP growth rate is 4.55%, with observed values fluctuating between -13.13% and 14.52%, indicating the economic variability throughout the analyzed period. The mean of trade openness is recorded at 166.18, indicating considerable variability, as evidenced by a standard deviation of 105.19. This variation reflects the differing trade policies and levels of economic integration present within the region. The dataset includes

140 observations for each variable, offering a detailed examination of the economic landscape in these countries.

4.2. Model testing results

This research assesses the influence of the internet on consumption patterns in Southeast Asian nations through the application of three panel data regression techniques: Random Effects Model (REM), Fixed Effects Model (FEM), and Driscoll-Kraay standard errors. The findings illustrated in Table 4.2 reveal that all models exhibit statistical significance at the 1% level, thereby underscoring the robustness and appropriateness of both the model and the data utilized. The results of the Hausman test indicate a preference for the Fixed Effects Model, demonstrating significance at the 1% level (p-value = 0.004), which implies that the FEM is better suited for this dataset. Diagnostic tests indicate the existence of autocorrelation and heteroskedasticity. In order to tackle these concerns, the Driscoll-Kraay standard errors are utilized to correct potential biases in the estimates.

Table 5 presents findings derived from the Driscoll-Kraay method, revealing that internet usage and economic growth variables exert a significant positive influence on consumption in the examined countries, achieving statistical significance at the 5% and 1% levels, respectively. In contrast, trade openness demonstrates a negative impact on consumption, with significance observed at the 10% level. The lagged consumption variable demonstrates a robust and statistically significant positive correlation with current consumption, suggesting the presence of consumption persistence across time periods.

4.3. Discussion

The variable representing internet usage demonstrates a positive impact on consumption activities within Southeast Asian nations, achieving statistical significance at the 5% level. The data presented supports the hypothesis that an increase in internet penetration correlates with heightened consumption activities within the region. This observation is consistent with the perspective presented by (Chunfang et al., 2023), who proposed that the growth of the internet has a considerable influence on the consumption patterns of goods and services, particularly within emerging markets (Bhattacharya et al., 2021; Chunfang et al., 2023). The internet provides enhanced access to information and goods, which contributes to increased consumer spending and improved market efficiency.

The relationship between economic growth and consumption in Southeast Asian countries demonstrates a statistically significant correlation at the 1% level. This suggests that economic expansion enhances consumer spending in the region, consistent with macroeconomic growth theory, which posits that economic growth fosters income, and according to the study by (Ma et al., 2020), it can lead to heightened levels of consumption. The significance of this variable's effect (0.739) highlights its essential function in shaping consumption trends in Southeast Asia.

At a 10% significance level, trade openness is found to have a negative impact on consumption. This finding is consistent with exchange rate effect in macroeconomics, which noted that increased trade openness might lead to a preference for imported goods over domestic ones

Table 5. Impact of Internet on Consumption

	$CONSUMPTION_{i,t}$			
Variable	REM	FEM	Driscoll-Kraay	VIF
$CONSUMPTION_{i,t-1}$	0.201*** (3.960)	0.196*** (3.747)	0.196*** (3.094)	
$INTERNET_{i,t}$	0.031** (2.641)	0.032** (2.700)	0.034** (2.631)	1.15
$GROWTH_{i,t}$	0.733*** (15.472)	0.739*** (15.108)	0.739*** (9.214)	1.20
$TRADE_{i,t}$	-0.012* (-1.981)	-0.015* (-2.173)	-0.013* (-1.962)	1.18
Constant	2.578 [1.803]	3.590** [2.272]	1.560 [1.472]	
Cross-sections included	5	5	5	
Observations	140	140	140	
Fixed period	Yes	Yes	Yes	
Hausman Test		10.75** [0.004]		
Breusch-Pagan Test		19.47*** [0.000]		
Wooldridge Test		6.74*** [0.000]		

Note: *, **, *** significant at 10%, 5% and 1%, respectively.

(Clarke & Wallsten, 2006; Meijers, 2014), potentially reducing local consumption levels. This phenomenon can be attributed to consumers' tendency to favor imported products, which might offer better quality or lower prices.

The lagged consumption variable (CONSUMPTIONi,t-1) shows a positive relationship with current consumption at a 1% significance level, indicating that past consumption trends significantly influence current consumption levels. The substantial impact of this variable (0.196) suggests that consumption patterns in Southeast Asia are strongly influenced by historical consumption behavior.

5. Conclusion and Managerial Implications

This study effectively fills the research gap on the direct impact of internet access on household consumption in Southeast Asia by utilizing a dynamic panel data methodology that integrates fixed and random effects with Driscoll-Kraay standard errors. The examination of data from Vietnam, Singapore, Thailand, Indonesia, and Malaysia from 1996 to 2023 unequivocally indicates that heightened internet usage exerts a statistically significant and favorable impact on consumption patterns. Furthermore, whereas economic growth strongly strengthens consumption, trade openness demonstrates a notable adverse effect, indicating that heightened dependence on imports may supplant domestic consumption.

Based on these findings, the research outlines the subsequent significant managerial implications. Policymakers should prioritize investment in digital facilities acknowledging that enhanced access to the internet directly fosters increased economic activity through increased consumption patterns. The findings highlight the need for improved regulatory frameworks and cybersecurity measures to protect consumers, ultimately creating a secure digital environment that encourages economic engagement. The inverse relationship between trade openness and consumption suggests that efforts to enhance domestic output might reduce the substitutive impact of imports. This necessitates focused governmental measures that promote local industries and maintain a balanced trade ecosystem.

By addressing these management implications, industry leaders and government authorities can more efficiently leverage the economic potential of digital innovations. Future study should intensify the examination of the causal mechanisms that support these correlations, further analyzing the relationship between internet access and consumer behavior across many economic circumstances. This will strengthen theoretical understanding and contribute to the development of more accurate and impactful economic policies in the emerging digital era.

While these findings provide valuable insights, the research recognizes specific limitations, such as the range of countries examined and the possible omission of other significant variables. Subsequent investigations may extend to other Southeast Asian nations and integrate factors like digital literacy and e-commerce penetration to enhance the overall comprehension of the subject matter.

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