Econometric Analysis of Online Game Transactions on Digital Economy Growth in Indonesia

Original Article

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Abstract

Digital transformation has made the online gaming industry a complex economic ecosystem. This study analyzes the econometric relationship between Transaction Money Turnover (NPT), Internet Access (AI), Internet Speed (KI), and Net Income (PB) with Economic Growth (PE) using the Ordinary Least Squares (OLS) method in the 2015-2024 time series data. The F test (ANOVA) shows that F counts 9.825 with a significance value of less than 0.001, proving that these four variables are simultaneously significant in influencing Economic Growth. The results of the partial t-test revealed that AI (t = 2.180, Sig. = 0.030) and PB (t = 3.704, Sig. less than 0.001) had a significant positive effect, while NPT (t = -3.323, Sig. less than 0.001) and KI (t = -2.733, Sig. = 0.007) showed a significant negative effect on PE. These findings indicate that the increase in transaction value and speed infrastructure has not been optimally utilized for the real economy. Implicitly, increasing digital literacy and incentives are needed to produce infrastructure as academically the empirical gap between nominal transactions and speed becomes the basis for further study of the integration of behavioral and institutional variables.

Keywords: Creative Economy, Digital Economy, Digital Infrastructure, OLS Regression, Online Game Transactions.

1.   Introduction

The digital transformation over the past ten years has fundamentally changed Indonesia's economic landscape. One of the fastest-growing sectors is the online gaming industry, which has evolved from mere entertainment into a complex economic ecosystem. According to the Indonesia Digital Economy Outlook 2024, the number of active gamers in Indonesia is estimated to exceed 60 million users, with transaction values continuing to increase significantly each year. These findings align with research by Kusumaningrum et al. (2024), which shows that creative industry subsectors, including gaming, have experienced rapid growth as a direct impact of digital transformation in Indonesia. In addition, Kesuma and Princes (2024) emphasize that Indonesia is one of the most promising gaming markets in Asia, where the structural characteristics of video games play a crucial role in driving user behavior and increasing transaction value within the online gaming ecosystem.

This development is supported by three main factors: first, the expansion of telecommunications infrastructure that has increased internet access to rural areas; second, decreasing mobile device prices that make technology more affordable; and third, the development of financial technology that facilitates secure and easy digital transactions (Nugraha et al., 2022; Suryono et al., 2021). Popular games such as Mobile Legends, Free Fire, and Genshin Impact have not only become pop culture phenomena but have also created new economic chains through in-game purchase mechanisms, virtual currency, and account trading.

Although quantitative growth appears impressive, a fundamental question that needs to be answered is whether this development has significantly contributed to sustainable digital economic growth. Several studies suggest that despite rising infrastructure, the productivity gains of Indonesian society remain limited (Privara & Caplanova, 2025). Research also indicates that the quality of digital infrastructure strongly influences the adoption of smart applications and digital payment tools, but high infrastructure does not always translate into broad economic benefit (Nugraha et al., 2022).

Based on this background, this study aims to analyze the econometric relationship between online game transactions and digital economy growth in Indonesia. Specifically, this research examines the influence of internet access, internet speed, and transaction value on the net income of digital economy actors using the Ordinary Least Squares (OLS) method (Gebeyehu et al., 2020; Oloyede et al., 2023).

However, empirical research examining the relationship between online game transactions and digital economy growth indicators in Indonesia remains limited. While several studies offer relevant frameworks and measurement approaches, similar empirical analyses on this specific topic are still relatively scarce (Ahmad & Ribarsky, 2018; Barefoot et al., 2018).

2.   Literature Review

2.1. Theoretical Framework

The Adoption of Innovation (AI) plays a key role as the main driver of digital growth because innovation accelerates productivity increases and expands economic capacity, in accordance with the endogenous growth framework (Desmaryani et al., 2024). Physical capital and digital infrastructure (PB) such as internet networks and data centers have also been shown to drive efficiency and accelerate digitalization, in line with empirical evidence on the economic impact of the digital economy (Oloyede et al., 2023). which empirically supports the Innovation Diffusion Theory and the Solow Growth Model as growth drivers.

On the other hand, Capital Intellectual (KI) that is not optimal can cause anomalies because the uneven quality of digital human resources causes innovation to not fully translate into productivity (Noerchoidah et al., 2025). In addition, inhibiting and cost factors (NPTs) such as data inefficiencies or institutional barriers can reduce the impact of innovation on growth, even though technology is already evolving (Çaldağ & Gökalp, 2023).
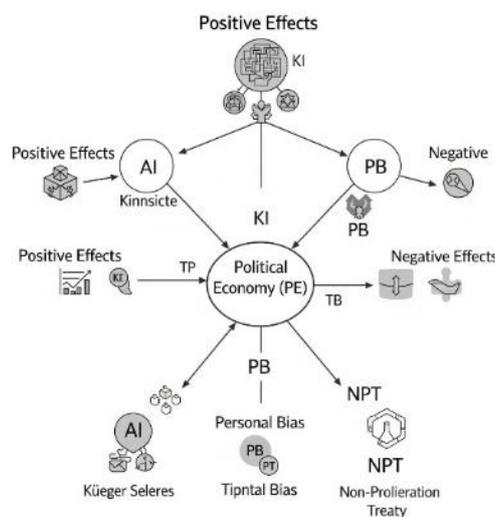

Figure 1. Correlation Between Variables

Figure 1 illustrates the correlation among the variables, which can be broken down into the following three key components:

1. Central Model: Economic Performance (PE) is the main dependent variable.
2. Positive Arrow (Supporting Theory): AI (Innovation Adoption) and PB (Physical Capital and Infrastructure) are indicated by positive arrows, which empirically support the Innovation Diffusion Theory and Solow Growth Model as growth drivers (Dykas et al., 2023; Wibowo, 2023)
3. Negative Arrow (Theoretical Anomaly): IP (intellectual capital) and NPT (Inhibiting Factors and Costs) are indicated by negative arrows that create anomalies in the context of endogenous growth models and digital economy frameworks, indicating the presence of structural inefficiencies or barriers (Oikawa, 2025).

2.2. Sollow Theory

Solow's theory, developed by Robert Solow, emphasizes the important role of physical capital accumulation and technological advances in economic growth. This theory argues that long-term economic growth depends on the level of investment and efficiency in the use of resources, including capital and labor. In the context of the digital economy in Indonesia, this theory is relevant because it shows that the development of digital infrastructure and investment in information technology can increase productivity. Research by (Nugraha et al., 2022) supports Solow's Theory by highlighting the need for investment in digital infrastructure to optimize growth in the digital economy sector. This shows that despite the improvement of infrastructure, the symptoms of lack of productivity indicate that the benefits of such investments have not been fully realized, in line with the findings by (Privara & Caplanova, 2025) on the limitations of productivity in Indonesian society and e-sports players.

2.3. Diffusion of Innovation Theory

Innovation diffusion theory examines the process through which information about innovation is disseminated and adopted by individuals or organizations. In the context of the digital economy in Indonesia, research shows that innovation has a significant impact on the growth of the creative industry, especially in the online gaming sector. This is in line with the theory that the characteristics of innovation, such as relative superiority and ease of adoption, have an effect on the adoption rate (Maddux & Rogers, 1983). A study by Oloyede et al. (2023) emphasizes the importance of digital infrastructure and technology adoption as drivers of economic growth, which supports the argument that innovation can increase productivity and expand economic capacity.

2.4. Previous Research

Based on various international studies (Gibson et al., 2023; Wadhwa & Balakrishnan, 2023), the development of the online gaming industry has shown significant economic and social impacts. According to the International Journal of Game-Based Learning, the use of game elements in the work environment has been shown to increase employee productivity, creativity, and well-being. This phenomenon signifies that games and gamification mechanisms can be applied positively in the professional sector to improve job skills. Furthermore, research by Computers in Human Behavior highlights the growing popularity of microtransactions in games that have become a major economic model, accounting for up to 70% of the global gaming industry's revenue. Although there are potential risks such as addictive behavior, the system also opens up new economic opportunities, such as the profession of game developers, item traders, and e-sports players.

Goh et al. (2023) through a systematic review in Telematics and Informatics Reports, it is explained that the video game industry is now the largest entertainment sector in the world, even surpassing film and music, with an economic value of more than 500 billion US dollars by 2027. This study confirms that the growth of this industry has created a new work ecosystem in the fields of creative technology, digital marketing, and the virtual economy. The research also reinforces that monetization systems such as loot boxes in FIFA games play a big role in creating value in the digital economy, where such virtual transactions generate billions of dollars and open up new opportunities in the trading of digital assets (Lemmens, 2022).

Bitrián et al. (2024), in terms of the application of gamification in the world of business and job training, show that gamification not only increases the motivation and competence of workers, but also expands new job opportunities in the digital training and information security sectors. A study indicates that game elements integrated into a company's training system can improve self-efficacy, skills, and create a need for professionals in the field of game-based training design (Sharma et al., 2024).

Raneri et al. (2022) Meanwhile, research and outlining the relationship between microtransactions and player behavior, shows that despite the risks of consumptive behavior, in-game transactions can also be a source of income for content creators, streamers, and game resellers. strengthen this by developing an In-Game Content Purchase Motivation (IGCPM) model that shows that the motivation to purchase digital items is triggered by the need for creativity, competence, and social relationships, elements that can be used in building a creative economy based on gamer communities (Gibson et al., 2023; Hussain et al., 2025).

Furthermore, his study on marketing in the metaverse reveals that the virtual world such as the metaverse and online games opens up a new economic space where business people can sell digital products, conduct interactive marketing, and create innovative customer experiences. In this context, the game-based digital economy has the potential to create new jobs in the virtual marketing sector, 3D asset development, and NFT-based creative economy services or virtual good (Kumar, 2024).

However, overall the previous research only discussed the potential and development without examining in detail the nominal amount of online game transactions in real conditions, so in this study we focused on researching several things that have not been researched previously such as the value of money turnover, income of business actors, internet speed factors in detail, and several other things that are closely related to online game transactions in Indonesia. It is also hoped that later there will be further studies that can develop this research to be more specific and discuss regional factors and certain characteristics in online game transaction patterns as one of the sources of digital economic. In some cases, even the increase in internet facilities actually reduces the level of economic growth because the facilities are not used for productive things which are instead used as entertainment media (Briglauer et al., 2024).

3.   Research Methods

3.1. Design and Data Sources

This study uses a quantitative approach with multiple linear regression analysis design. The data used is time series data from 2015 to 2024 with 50 respondents selected through purposive sampling. The respondent criteria are digital economy actors who have actively conducted online game transactions for at least 3 years consistently.
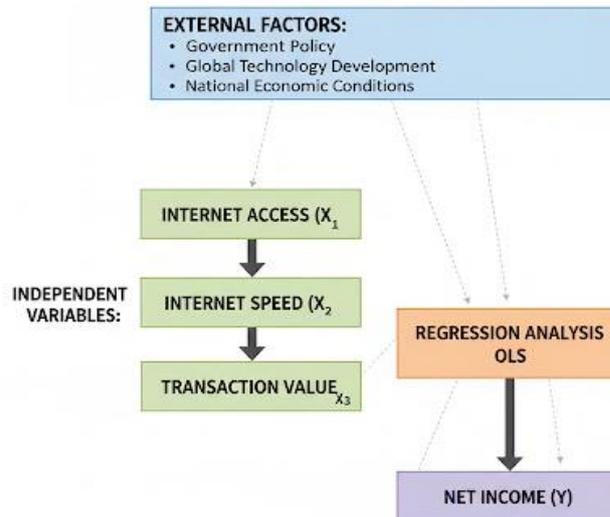
Figure 2. Conceptual Framework

Figure 2 presents the study's conceptual framework. The proposed relationships within this framework give rise to the following research hypotheses:

a. H_1: Internet access significantly affects the net income of digital economy actors
b. H_2: Internet speed significantly affects the net income of digital economy actors
c. H_3: Online game transaction value significantly affects the net income of digital economy actors

3.2. Research Variables

The variables used in this study are defined in Table 1. Each variable is described by its symbol, a measurable indicator, the scale of measurement, and the source from which the data was obtained.

Table 1. Operational Definition of Research Variables

Variable	Symbol	Indicator	Scale		Data Source
Net Income	Y	Natural liogrraph of annual net income	Ratio	Ratio	Questionenine and interview
Internet Access	X_1	Percentage of population with internet access	Ratio	Ratio BPS and APJII	
Internet Speed	X_2	Average download speed (Mbps)	Ratio	Speedtest Global Index	
Transaction Value	X_3	Natural liogrraph of annual transaction value	Platform	Platform transction data	

3.3. Analysis Technique

Data analysis was conducted in several stages:

1. Classical assumption tests: normality (Kolmogorov-Smirnov), multicollinearity (VIF), autocorrelation (Durbin-Watson), and heteroscedasticity (Glejser)
2. Parameter estimation using Ordinary Least Squares (OLS)
3. Simultaneous significance testing (F-test) and partial testing (t-test)
4. Analysis of determination coefficient (R^2)

All analyses were conducted using IBM SPSS Statistics 26 software at a significance level of $\alpha = 0.05$.

4. Results and Discussion

4.1. Research Results

4.1.1. Instrument Test

A. Validity Test

Table 3. Validity Test Result

Correlations

		NPT	AI	KI	PB	PE
NPT	Pearson Correlation	1	.873**	.834**	.863**	.440**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	500	500	500	500	500
AI	Pearson Correlation	.873**	1	.915**	.799**	.550**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	500	500	500	500	500
KI	Pearson Correlation	.834**	.915**	1	.723**	.565**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	500	500	500	500	500
PB	Pearson Correlation	.863**	.799**	.723**	1	.318**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	500	500	500	500	500
PE	Pearson Correlation	.440**	.550**	.565**	.318**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	500	500	500	500	500

**. Correlation is significant at the 0.01 level (2-tailed).

The decision to declare the research instrument valid is if the value of the computational correlation coefficient for each item exceeds the table value, or statistically, the significance value (p-value) must be below the threshold of a = 0.05. The fulfillment of this criterion confirms that the initial data of variables such as the Transaction Turnover Value (NPT) accurately reflects the construct.

Table 3 illustrates the Pearson correlation matrix for the variables NPT, AI, KI, PB, and PE. All correlations are significant ($p < .001$). The findings support the validity of the instrument, with each item's correlation coefficient surpassing the critical table value and p-values below α = 0.05.

B. Reliability Test (using preliminary data)

Table 4. Feasibility Test Result

Reliability Statistics

Cronbach's Alpha	N of Items
.600	4

The decision to declare the research instrument reliable (consistent) is reached if the value of the Alpha Cronbach coefficient is above the accepted threshold, i.e. > 0.60 or, ideally, > 0.70. These criteria must be met to ensure that the data used is stable and not affected by random measurement errors. Table 4 indicates that the research instrument demonstrates sufficient internal consistency, as the coefficient exceeds the standard threshold.

C. Data Normality Test (per variable)

Table 5. Normality Test Result

One-Sample Kolmogorov-Smirnov Test

		NPT	AI	KI	PB	PE
N		440	500	440	500	440
Normal Parameters[a,b]	Mean	17.2381	4.3374	3.8839	16.3501	2.1427
	Std. Deviation	.21377	.15175	.19848	.34289	.04713
Most Extreme Differences	Absolute	.058	.061	.085	.252	.041
	Positive	.052	.053	.044	.252	.029
	Negative	-.058	-.061	-.085	-.115	-.041
Test Statistic		.058	.061	.085	.252	.041
Asymp. Sig. (2-tailed)[c]		.001	<.001	<.001	<.001	.076
Monte Carlo Sig. (2-tailed)[d]	Sig.	.001	<.001	<.001	<.001	.075
	99% Confidence Interval Lower Bound	.000	.000	.000	.000	.068
	Upper Bound	.002	.000	.000	.000	.082

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 297761863.

The purpose of this test is to confirm that the data distribution of each natural logarithmic variable (LNY, LNX1, etc.) is close to normal. The decision is reached if the significance value (p-value) of the Normality statistical test (e.g., Kolmogorov-Smimov) is > 0.05. If these conditions are met, the assumption of data normality for parametric regression analysis has been met. Table 5 shows that four variables (NPT, AI, KI, PB) deviate from a normal distribution ($p < .05$), while the distribution of PE is not significantly different from normal ($p = .076$).

4.1.2. Classical Assumption Test

A. Multicollinearity Test

Table 6. Multicollinearity Test Result

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	NPT	.140	7.126
	AI	.152	6.563
	KI	.170	5.869
	PB	.223	4.478

a. Dependent Variable: PE

As seen in table 6, the model is declared free of Multicollinearity if the Variance Inflation Factor (VIF) value for all variables is free < 10, and simultaneously the Tolerance value > 0.10. Fulfillment of these criteria is very important to ensure that the estimation of regression coefficients is stable and unbiased due to the high collinearity between independent variables.

B.   Autocorrelation Test

Table 7. Autocorrelation Test Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.288[a]	.083	.074	.04535	2.024

a. Predictors: (Constant), PB, KI, AI, NPT

b. Dependent Variable: PE

Looking at the table 7, the model is declared free of Autocorrelation if the Durbin-Watson value (DWtil) is within the range du < DW of the <4-dy calculation. This decision ensures that the residual model is independent between observation periods, which is a crucial prerequisite for time series or panel data.
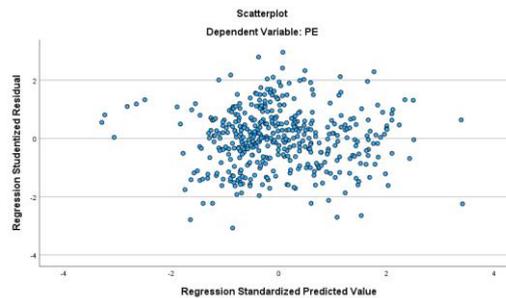
C.   Heteroscedasticity Test

Figure 3. Heteroscedasticity Test Result

The model is declared free of Autocorrelation if the Durbin-Watson value (DWtil) is within the range du < DW of the <4-dy calculation. This decision ensures that the residual model is independent between observation periods, which is a crucial prerequisite for time series or panel data.
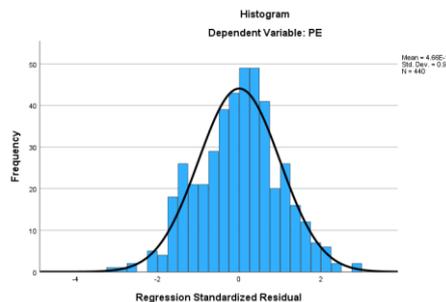
D.   Residual Normality Test

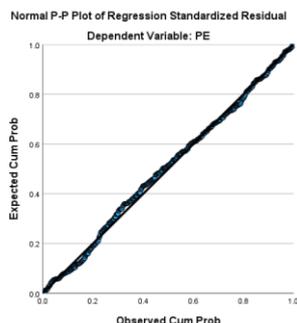### Figure 4. Residual Normality Test Result

Figure 5. Residual Normality Test Result

Residual normality as the last assumption must be met to validate the entire statistical inference. The decision to accept residual normality is if the significance value (p-value) of the statistical test is > 0.05. This criterion ensures that the subsequent hypothesis tests F and t can provide valid inference results.

4.1.3. Hypothesis Test

A.   F Test

Table 8. F Test Test Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.081	4	.020	9.825	<.001[b]
	Residual	.895	435	.002		
	Total	.975	439			

a. Dependent Variable: PE

b. Predictors: (Constant), PB, KI, AI, NPT

The F-test is employed to ascertain whether the quartet of independent variables exerts a statistically consequential influence on Economic Growth when evaluated collectively. The results as in table 8 indicate that the model is unequivocally significant, as evidenced by a probability value far below the conventional threshold (Sig < 0.001) and an F-statistic of 9.825, which is markedly substantial for a socioeconomic specification of this nature. These findings imply that Transaction Turnover Value, Internet Access, Internet Speed, and Net Income jointly elucidate a meaningful proportion of the variance in Economic Growth.

Substantively, the magnitude of transaction turnover reflects the dynamism of digital economic exchanges; the prevalence of internet access signifies a broader diffusion of connectivity that amplifies economic participation; internet speed represents the qualitative robustness of digital infrastructure that accelerates structural transformation; and net income contributes directly to economic expansion through augmented purchasing power and intensified consumption capacity. Collectively, these variables demonstrate a synergistic capacity to shape the trajectory of economic growth in a statistically defensible and empirically cogent manner.

Because the F test is significant, then: The four variables of the digital economy and income should be used to predict economic growth. Based on the results of the F Test in the ANOVA Table, an F value of 9.825 was obtained with a significance value of < 0.001. Because the significance value is less than 0.05, it can be concluded that the variables NPT, AI, KI, and

PB simultaneously have a significant effect on Economic Growth. Thus, the regression model used is feasible to continue with partial testing (t-test) and determination coefficient analysis.

B.   T Test

Table 9. T Test Result

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.729	.295		9.243	<.001
	NPT	-.090	.027	-.407	-3.323	<.001
	AI	.097	.045	.256	2.180	.030
	KI	-.072	.026	-.304	-2.733	.007
	PB	.050	.013	.360	3.704	<.001

a. Dependent Variable: PE

In the t-test, the hypothesis as seen in table 9 stating that there is no influence is rejected, and the partial influence of the variable is accepted, if the value of Sig. t < 0.05 or the absolute value of the t value exceeds the t table. This decision allowed the researchers to conclude that specific variables, such as LNX1 (Transaction Turnover Value), had a significant individual influence on LNY.

C.   T Test Hypothesis

Table 10. Output Summary

Variables	B	t	Sig	Conclusion
NPT	-0.090	-3.323	< 0.001	Significant, negative effect
AI	0.097	2.180	0.030	Significant, positive effect
KI	-0.072	-2.733	0.007	Significant, negative effect
PB	0.050	3.704	< 0.001	Significant, positive effect

As shown in the table 10, the coefficient estimations for each independent variable indicate that all four regressors exert statistically significant influences on Economic Growth at the 5% level, as demonstrated by p-values below 0.05 and t-statistics of considerable magnitude. First, the NPT variable exhibits a negative and significant coefficient (B = −0.090; Sig < 0.001), implying that an increase in transaction turnover value, ceteris paribus, diminishes economic growth by 0.090 percent. This counterintuitive pattern suggests that elevated digital transaction volumes may be disproportionately driven by speculative, non-productive, or purely consumptive activities that fail to translate into real economic expansion, thereby creating a structural disconnect between digital activity and tangible output.

Conversely, Internet Access (AI) manifests a positive and statistically significant effect (B = 0.097; Sig = 0.030), indicating that a 1 percent rise in population connectivity enhances economic growth by approximately 0.097 percent. This finding underscores the catalytic role of digital inclusion, wherein broader internet availability facilitates entrepreneurial activity, accelerates e-commerce penetration, and enhances operational efficiency within productive sectors.

The KI variable, representing internet speed, yields a negative and significant coefficient (B = −0.072; Sig = 0.007). This suggests that higher internet speeds are paradoxically associated with a 0.072 percent reduction in economic growth. Substantively, this may reflect underutilization of high-speed internet for productive purposes, excessive diversion toward entertainment consumption, or infrastructural investment burdens that have yet to generate

proportional economic returns. It may also indicate spatial disparities wherein regions with superior internet infrastructure do not concurrently possess robust economic ecosystems.

Finally, Net Income (PB) demonstrates a positive and highly significant association with economic growth (B = 0.050; Sig < 0.001). Increased income directly strengthens purchasing power, stimulates consumption, and expands household capacity for savings and investment, each of which constitutes a fundamental driver of macroeconomic expansion. Collectively, these results affirm that PB functions as a critical indicator of welfare and exerts a consistently stimulative effect on economic performance.

D. Coefficient of Determination

Table 11. Coefficient of Determination Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.288[a]	.083	.074	.04535	2.024

a. Predictors: (Constant), PB, KI, AI, NPT

b. Dependent Variable: PE

The coefficient of determination in this model demonstrates a relatively limited explanatory power. The R Square value of 0.083 indicates that only 8.3% of the variability in Economic Growth can be attributed to the combined influence of NPT, AI, KI, and PB. After adjusting for model complexity, the Adjusted R Square decreases to 0.074, meaning that the true explanatory contribution, after accounting for the number of predictors, is approximately 7.4%. These values suggest that, although the included variables exert statistically significant individual and joint effects, the vast majority of the fluctuations in Economic Growth are shaped by external factors beyond those incorporated into this regression framework.

4.2. Discussion

The results of the study showing that Net Income (PB) has a positive and very significant influence on PE with a coefficient of B = 0.050 and p less than 0.001 is a strong empirical confirmation of the fundamental principle of the Solow Model of Economic Growth presented by (Dykas et al., 2023). In the Neoclassical framework, the increase in the PB reflects the accumulation of physical capital and purchasing power, which is the main driver of increased output and investment. The very high significance (t = 3,704) reinforces that the fundamentals of traditional economics (capital accumulation) are still dominant and essential in explaining growth, complementing the influence of digital variables.

The relationship of the results of the study with a review of the benefits of high-speed broadband by (Briglauer et al., 2024) has a dual nature: on the one hand, positive and significant Internet Access (AI) findings (B = 0.097; p = 0.030) support the literature argument that the adoption of broadband services improves market efficiency and inclusion. However, on the other hand, the findings of anomalies in Internet Speed (KI) that were negative and significant (B = -0.072; p = 0.007) indicated an implementation gap. The negative coefficient of AI validly indicates that although the speed infrastructure is improved, the theoretically expected productive benefits have not been realized, thus leaving a challenge recognized in the literature. Usually, the improvement of internet infrastructure is also not balanced with productive things that are actually used as entertainment media (Briglauer et al., 2024)

The finding that Internet Access (AI) is positively and significantly correlated with Economic Growth (B = 0.097) has an essential relevance to the concept of diffusion of innovation and digital infrastructure discussed by (Santoso et al., 2023). This positive coefficient statistically validates the role of internet access as the most fundamental enabler, confirming that the internet network is the foundation that enables the diffusion of innovation and technology adoption by business actors. Without increased access (AI), the economic benefits of digital technologies cannot be widely distributed, so measurable PE increases are a direct result of increased adoption capacity and connectivity.

Significant anomalies in Transaction Money Turnover (NPT) that negatively affected PE (B = -0.090; p less than 0.001) were closely related to the study by (Gibson et al., 2023) which reviews aspects of Micro-transactions in online gaming and their potential impact. This study provides strong quantitative evidence (t = -3,323) that money turnover dominated by gaming transactions may be more consumptive non-productive and potentially erode household purchasing power, in line with the concerns highlighted by the study by (Gibson et al., 2023) Regarding problematic spending. The negative coefficient B = -0.090 validly reinforces that an increase in certain digital transactions can hinder macroeconomic growth.

The link between negative NPT anomalies and the literature (Goh et al., 2023) It lies in the framework of the video game industry and its monetization strategy. The research sheds light on the complexities of VGI's business model, including innovative monetization strategies, which explains why NPTs have great value. Then, the findings of this study with a negative coefficient of B=−0.090 provide statistical evidence that although the industry is innovative, the output measured in PE is negative. This shows that the monetization strategy discussed by (Goh et al., 2023) may be extractive or circular in the digital ecosystem itself, and have not been effective in generating added value that translates into broader GDP growth in the real sector.

5. Conclusion

That the more people have internet access, economic growth tends to increase. The higher the internet speed, it turns out that economic growth tends to decline (in this model), perhaps due to non-productive reasons or infrastructure costs. The increase in internet access Ceteris Paribus is related to increased economic growth. After controlling for other variables, increased transaction turnover was associated with a decrease in economic growth. Based on the results of the t-test in the Coefficients Table, the NPT variable has a t-value of −3.323 with a significance of < 0.001, so it can be concluded that the NPT has a negative and significant effect on Economic Growth. The AI variable has a t-value of 2,180 with a significance of 0.030, indicating that AI has a positive and significant effect. Meanwhile, the IP variable shows a t-value of -2,733 with a significance of 0.007, which means that IP has a negative and significant effect on Economic Growth. The PB variable has a t-value of 3,704 with a significance of < 0.001, so that PB has a positive and significant effect on Economic Growth. Thus, the four independent variables in this model were shown to have a partially significant influence. Further research can expand the model by adding behavioral and institutional variables such as digital literacy or entrepreneurship indexes, or using panel data to look at dynamic effects across regions and between periods.

5.1. Acknowledgments

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