

The Role of Technology and Investment in Digitalization and The Economy in Malaysia

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Abstract

This study aims to determine the role of technology, especially the internet, and investment trends in the non-financial sector in the development of the Malaysian economy. We take data from the World Bank as a secondary source for the years 2000 to 2020, From our estimation results, We find that the variables we estimate have long-term and short-term correlations such as the variable economic growth with the development of internet users and economic growth with investment, in the short term an increase in the development of internet users will have a positive effect on economic growth, but in the long run, the opposite is true. , it is different with investment and economic growth variables, in the short term this variable will have a negative impact on economic growth, but in the long term, an increase in investment will greatly affect the performance of economic growth. This shows that in the long term, digitalization of the economy is still a significant step in projecting economic growth in Malaysia.

Keyword : Economic growth, Technology, Investment, Malaysia.

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Background

The digital economy era started in the 1980s to achieve business efficiency by utilizing the use of personal computers and supported by the internet and became the beginning of the development of electronic commerce. The main feature of the digital economy is to conduct global trade and shorten the chain of intermediaries. The digital economy as a concept popularized by Don Tapscott has shifted the paradigm in information technology and the internet. The digital economy drives an economy based on internet digital technology. The era of the old digital economy is transformed into the era of the new digital economy with mobile technology as the driving force, accompanied by unlimited internet access and cloud technology to support digital economic activities. Almost the entire process of creating products and services along with their marketing activities, determining business strategies, to identifying company competitiveness has been driven by the power of information technology. The concept of digital economy explains that the global impact brought about by information technology includes the internet and the economic field, which is the interaction between innovation and increasingly advanced technology and affects macro and microeconomics. The digital economy is growing by bringing changes to the business pattern of people's consumption patterns, which originally liked shopping at traditional retail stores to shopping patterns at online retail stores on marketplaces or e-commerce (Nizar & Sholeh, 2021).

The internet serves as a medium of trade in the digital economy, which entails value creation and exchange through virtual media, as well as transactions and interactions between established economic players. The "digital economy" refers to the commercial use of digital information and

communication technology and the ensuing empowerment. Southeast Asia is seeing significant growth in the digital economy, and there is a sizable market there (Hinning, 2018).

Digital transformation has almost mastered all business processes, from how products and services are produced to marketing activities, how the structure and targets of the company's achievements, the dynamics of the competitive environment, to how the formula for the success of a business is found. The existence of computers, telecommunications, to entertainment has been united by the power of technology and the internet. The development of digital technology in almost all aspects of people's lives, also known as the Industrial Revolution 4.0, is an important factor, especially in economic growth. In this era of the Industrial Revolution 4.0, industry players, both public and private, compete with each other in their business processes by taking advantage of the advantages brought by technology and information systems and directing manufacturing technology to the trend of automation and data exchange (Ellitan, 2020).

Information and communication technology is growing rapidly to become a driving factor in digital transformation that makes the industrial order not the same anymore. One of the impacts of the development of information technology that gave birth to a massive digital transformation is the increasing prevalence of e-commerce platform business activities (Soniansih & Sulisnaningrum, 2021). Digital transformation has brought about complex and interrelated influences on society and the economy. This has resulted in many parties, both policymakers in the public sector and business actors in the private sector, making approaches to designing new business strategies. The creation of a digital platform as part of digital transformation has become the best medium for business actors to maximize the added value of their products (Ellitan, 2020).

A digital cultural mentality is necessary for all users of technology, including the general public, commercial actors, and even government organizations. In this situation, it is necessary to utilize the whole communication network, all of our apps, and even our big data sensibly, in compliance with the law, and with an intelligent information filter (Nham & Ha, 2022). The digital economy offers freedom for commercial dealings that don't require face-to-face interaction. In the event of the Covid-19 pandemic, this is an alternative. In fact, the digital economy is expanding right now. The Covid-19 epidemic has altered peoples' perspectives and actions in their social and economic interactions. The event is conducted in accordance with a revised schedule and urges participants to follow safety regulations (Aprilia, Waluyo, & Saragih, 2021).

The digital economy may be understood as how people choose to satisfy their limitless wants using just their fingertips, or it can be understood as how people engage in manufacturing, consumption, and distribution activities using their fingers. According to the concept of the digital economy given above, people no longer need to go to the market to purchase products and services since they can just order them on their smartphones and have them delivered to their homes to satisfy their needs (Permana & Puspitaningsih, 2021).

Economic performance is very important for every country to provide a decent life for all its citizens. Economic growth that can create new economic growth in the future with increased economic growth will have an impact on increasing investment, both physical investment such as better infrastructure and non-physical investment such as investment in human resources in the form of improving health services and affordable education services for all levels of society (Liu, Luan, Wu, Zhang, & Hsu, 2021). The performance of human resources is driven by technology. The introduction of technology is crucial for economic progress overall (Christiana & Malik, 2021). Rapid computer and digital technology development in the current digital era drives consumption and makes communication and economic coordination easier. Better technological

adoption and investments in human capital are results of economic progress. in order to facilitate future economic growth (Astuti & Prabowo, 2021).

The power of knowledge in the scope of digital transformation leads to superior innovations in the discovery of new opportunities as business competitiveness. Digitization encourages ease and speed in business transactions, where customers as digital consumers will use digital devices to carry out their transactions. Virtualization in digital transformation will enable changes from physical goods to virtual goods, as well as enable intellectual capital to turn into digital capital. Molecurization in the digital economy is the change in heavy business processes into lighter and more flexible business processes, for example by converting stacked paper documents into space-saving digital documents. The internet network plays an important role in digital transformation by building interconnections that form an economic network. Disintermediation in the digitalization era eliminates the role of intermediaries, so transactions can take place directly in a peer-to-peer manner. The establishment of a platform for interactive multimedia with the convergence of computing, communication, and content. Innovation is formed from human imagination and creativity in creating sources of economic value. The digital transformation that has an impact on the birth of a new economy, namely the digital economy has a number of characteristics, namely: unlimited and customizable differentiation opportunities, utilization of the internet network for wider and faster consumer reach, and unlimited access by anyone (Adha, Asyhadie, & Kusuma, 2020 ; Priyanto, Widarni, & Bawono, 2022).

Internet users have demonstrated economic growth, educational achievement, physical health, and inflation while studying the digital economy. This is consistent with a study by (Irawan & Laura, 2022), which found that technological literacy actually lowers GDP in Indonesia. It also demonstrates how poorly Indonesians use the internet for business. Or, the vast majority of Indonesians use the internet to unwind and purchase digital products from other nations, which lowers the country's GDP because fewer people are familiar with internet technologies. However, in Indonesia, where internet technology is frequently employed in the classroom, online literacy boosts education. Through schooling alone, internet literacy in Indonesia has rapidly expanded. Indonesia's digital economy has demonstrated its ability to control inflation, despite its small size. This shows how the digital economy has the potential to reduce inflation, although it has not yet operated optimally in Indonesia. Most Indonesian internet users currently use or buy digital goods from countries outside Indonesia, so they cannot support domestic economic growth.

The digital and green economy hastens economic expansion. Through a green economy and a digital economy, a more sustainable and technologically advanced society is being built (Ma & Zhu, 2022). Digital and information technology has lessened the negative effects of the economic catastrophe brought on by the Covid-19 outbreak. The argument is that digital technology gives economic room for survival amid the COVID-19 epidemic (Ben-Ahmed, Ayadi, & Hamad, 2021). The use of digitalization today is inseparable from people's daily lives, for example in terms of the use of computer technology, entertainment, digital games, electronic currency (e-money), digital media, and films. The Industrial Revolution 4.0 has accelerated product development, created consumer diversity, and relatively cheaper product prices. In addition, a study from the World Economic Forum predicts that this technological development will bring about a change in employment that reaches 75 million jobs and simultaneously will appear 133 million new jobs in the next 4 years (Sun & Tang, 2022). This study aims to

determine the role of technology, especially the internet, and investment trends in the non-financial sector in the development of the Malaysian economy.

Research methods

We take data from the World Bank as a secondary source for the years 2000 to 2020, the following variables will be analyzed using two different time series models. The country's GDP is used as a measure of economic growth in this study. Internet user development (TC) and investment (INV) are independent variables of this study because they serve as indicators of how these two variables are related in the long and short term to economic growth. We use the following econometric model:

$$EG_t = \beta_0 + \beta_1 EG_{t-1} + \beta_2 EG_{t-2} + \beta_3 EG_{t-3} + \beta_5 IUD_t + \beta_6 IUD_{t-1} + \beta_7 IUD_{t-2} + \beta_8 IUD_{t-3} + \beta_9 IUD_{t-4} + \beta_{10} INV_t + \beta_{11} INV_{t-1} + \beta_{12} INV_{t-2} + \beta_{13} INV_{t-3} + \beta_{14} INV_{t-4} + e_t$$

Where,

EG : economic growth

IUD : internet user development

INV : investment

e : Error term

t : Time series

In the study, dynamic ARDL was employed. The ARDL model, according to Khan et al. (2020), may be used to investigate, simulate, and make predictions when the independent variables experience a shock. If there is a cointegration relationship between the studied variables, ARDL simulation models may be used.

Result and Discussion

Table 1 displays descriptive data based on the study's variables.

Table 1. Descriptive Statistics

	EG	IUD	INV
Mean	4.559798	57.81279	5.249794
Median	5.332139	56.30000	5.218901
Maximum	8.858868	89.55501	9.340472
Minimum	-5.646940	21.38473	3.063720
Std. Dev.	3.173540	19.12861	1.875824
Skewness	-1.961798	-0.184270	0.627665
Kurtosis	6.695058	2.249091	2.654908
Jarque-Bera	25.41705	0.612226	1.483075
Probability	0.000003	0.736303	0.476381
Sum	95.75576	1214.068	110.2457
Sum Sq. Dev.	201.4271	7318.072	70.37433
Observations	21	21	21

The results of descriptive statistics are expressed in terms of mean, min, max, and Std Dev. EG Mean 4,559, EG Min -5,646, EG Max 8,858, EG Std Dev 3,173. IUD Mean 57,8, IUD Min 21,38, IUD Max 89,5, IUD Std Dev 19,1, and so on. EG is Malaysia's economic growth, IUD is the development of internet users, and INV is investment in the non-financial sector.

The ARDL model should not be used to forecast the value without first performing a stationary test. Augmented Dickey-Fuller (ADF) may evaluate whether a series is stationary or not by examining the error component, which includes any potential for autocorrelation. The results are as follows:

Table 2. Unit Root Test On EG, INV, And IUD Data

Variable	Unit Root	ADF Test stat.	Signif.	Description
Economic Growth (EG)	Level	-3.865447	0.0089	Stationer
Investment (INV)	Level	-0.973280	0.7420	
	First Diff	-3.918851	0.0083	Stationer
Internet user development (IUD)	Level	-1.014848	0.7271	
	First Diff	-4.177608	0.0049	Stationer

The EG data is stationary in the original data, while the INV and IUD data are stationary in the first difference. Since all the data are stationary, we can proceed to estimate the ARDL.

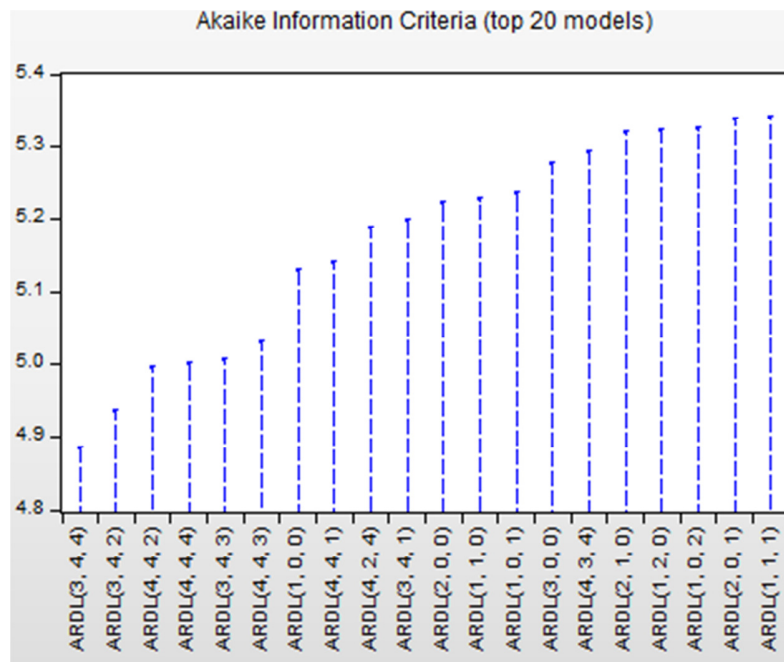


Figure 1. Optimum Lag Test

The best lag to employ in the following test is determined by optimal lag testing, and as can be seen in the image above, the best lag is 3,4,4.

Tabel 3. ARDL Bounds Test

Test Stat.	Value	Significant	I(0)	I(1)
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F-statistic	3.421793	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

Asympotic:n=1000

The F-statistic value of the ARDL model is 3.421793 which is higher than the upper limit value at the 5 percent level based on the results of the Limit model test shown in Table 3. This shows the cointegration, or movement in the same direction, of the three variables, studied in the study.

Tabel 4. ARDL Analysis Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EG(-1)	-1.423286	0.653197	-2.178955	0.1175
EG(-2)	-1.363659	0.678580	-2.009578	0.1380
EG(-3)	-1.523748	0.643500	-2.367907	0.0987
IUD	-0.495042	0.288890	-1.713598	0.1851
IUD(-1)	0.299155	0.299711	0.998145	0.3918
IUD(-2)	-0.180037	0.273716	-0.657752	0.5577
IUD(-3)	0.050891	0.266682	0.190832	0.8608
IUD(-4)	-0.366046	0.204193	-1.792652	0.1709
INV	-2.208851	1.406996	-1.569906	0.2145
INV(-1)	-2.668859	2.265524	-1.178032	0.3237
INV(-2)	-0.501128	1.771508	-0.282882	0.7957
INV(-3)	-1.420356	1.643710	-0.864116	0.4511
INV(-4)	1.056141	1.176353	0.897809	0.4355
C	94.80547	39.33950	2.409931	0.0950
R-squared	0.845480	Adjusted R-squared		0.175891

The R-squared and R-squared values of the adjusted ARDL models varied between 0.84 and 0.17. Adjusted R-squared value of 0.17 implies that each independent variable in the ARDL model, namely the development of internet users and investment can explain 17 percent of the variation in the dependent variable of economic growth. This shows that the research model is good enough to be researched. Judging from the ARDL estimation results, the IUD variable (-3) has a coefficient value of 0.050 which indicates that the development factor of internet users is a factor that affects economic growth. For example, a 1% increase in internet user development would result in a 5% increase in Malaysia's economic growth. This shows that the increasing number of internet users will accelerate the digitalization process, both in the government sector and the economy, which will certainly contribute to economic growth in Malaysia in the short term. Furthermore, the INV(-2) variable has a coefficient value of -0.50 which indicates that the investment factor of the previous two years is a factor that affects current economic growth. For example, when there was an increase in investment in the previous two years by 1% it would explain about 50 percent of the reason for the current decline in Malaysia's economic growth. In other words, investment performance in the previous two years in the short term is actually very influential in projecting how economic growth will perform this year.

Table 5. Analysis Results In The Long Term And Short Term

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	94.80547	39.33950	2.409931	0.0950
EG(-1)*	-5.310693	1.635176	-3.247782	0.0476
IUD(-1)	-0.691079	0.318128	-2.172334	0.1182
INV(-1)	-5.743052	2.827565	-2.031095	0.1352
D(EG(-1))	2.887407	1.178281	2.450525	0.0916
D(EG(-2))	1.523748	0.643500	2.367907	0.0987
D(IUD)	-0.495042	0.288890	-1.713598	0.1851
D(IUD(-1))	0.495192	0.257000	1.926817	0.1496
D(IUD(-2))	0.315155	0.223316	1.411249	0.2530
D(IUD(-3))	0.366046	0.204193	1.792652	0.1709
D(INV)	-2.208851	1.406996	-1.569906	0.2145
D(INV(-1))	0.865342	1.873430	0.461903	0.6756
D(INV(-2))	0.364214	1.376152	0.264661	0.8084
D(INV(-3))	-1.056141	1.176353	-0.897809	0.4355

From the table above, the relationship between the EG and IUD variables (-1) is significantly negative, this means that in Malaysia in the short term or the previous year the development of internet users has a negative effect on economic growth, but in the long term, an increase in the development of internet users will increase economic growth too. On the other hand, the relationship between the variables EG and INV(-1) is negative and not significant.

Conclusion

We find that the variables we estimate have long-term and short-term correlations such as the variable economic growth with the development of internet users and economic growth with investment, in the short term an increase in the development of internet users will have a positive effect on economic growth, but in the long run, the opposite is true. , it is different with investment and economic growth variables, in the short term this variable will have a negative impact on economic growth, but in the long term, an increase in investment will greatly affect the performance of economic growth. This shows that in the long term, digitalization of the economy is still a significant step in projecting economic growth in Malaysia.

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