Digital Economy in The Global Collaboration Economic Age

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Abstract

The purpose of this research is to find out more about the confounding influence between internet users, domestic consumption, and economic growth in Indonesia and Malaysia. This study uses vector calculations where each regression relationship will be brought together so that each variable will alternately become the dependent variable and the independent variable. In this study, we look at internet users, consumption, and GDP use in Indonesia and Malaysia. The following multivariate regression model was used to investigate the causal association between variables internet users, consumption, and GDP in Indonesia and Malaysia. We found the readiness of the countries of Indonesia and Malaysia in the application of the digital economy has differences including the application of blockchain technology and cryptocurrency which is indicated by a causal relationship between internet users, domestic consumption, and economic growth. Although the two countries indicate that there has not been a digital economy boost in national economic growth, which is signed by the negative correlation between internet users and GDP in both countries, it can be concluded that both countries are more dominant in applying the traditional economy.

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Introduction

The blending of economy, technology, and socio-culture in the world today is forming a new economy that we know as the digital economy. The precursor is the digital economy of the birth of a more mature intellectual economy with a blend of economics, technology, and socio-culture. This study explores the social phenomena of technological progress and economic disruption, especially Blockchain technology.

Roos & Hahn (2019) revealed that today's digital economy is a meeting of the global economy, technology, and socio-culture that shifts the conventional economic system. Ertz et al (2016), explain that digital technology allows for multiple organization to peer exchanges, peer to organization, and peer to peer. Ghilal & Nach (2019) explained that the birth of blockchain technology was an impact on the development of computer science and mathematics. Blockchain technology enables peer-to-peer exchange with a minimum of intermediaries.

Research literature related to the collaborative economy and blockchain technology in its characteristic, namely the existence of peer to peer exchanges, is still very rarely found in literature, both books and scientific journals. Therefore, the purpose of everything in this research is to examine the role of blockchain technology in the development of the global collaborative economy.

We investigate the confounding influence between internet users, domestic consumption and economic growth in Indonesia and Malaysia. These three variables are the key to the digital economy. We chose Indonesia and Malaysia because they are 2 important countries in Southeast Asia and have similarities in terms of ethnicity, race, religion and language and have economic similarities.

Conceptual Background

White (2017) explains that the concept of cryptocurrency has been adopted by various branches of science such as political, economic, and social science. Houben & Snyers (2018) strengthen the opinion of White (2016) through his research in Europe that financial and banking institutions in Europe make cryptocurrency a form of digital currency. The adoption of the cryptocurrency concept in finance is getting stronger in Europe.

Maese et al. (2016) explained that the function of crypto currency, as well as traditional money, is as a medium of exchange. It's just that crypto currency is digital and independent without being tied to the state or central bank. Crypto currency itself is the exchange of digital information recorded through the principles of cryptography.

Ghilal & Nach (2019) explains that cryptocurrency is a currency that allows its owner to exchange digital currency in the form of goods and services. However, crypto currency is not a legal currency because there is no central bank or country that issues and authorizes crypto currency. one of the most valuable currencies today is bitcoin was created in 2008 by Satoshi Nakamoto. Nakamoto (2008) explains that the role of cryptocurrency is to overcome the weakness of the financial system which requires authorization on every exchange system globally, thereby creating transaction costs. Lee et al (2018) explained that the exchange system for cryptocurrencies is peer to peer and electronic. Bitcoin as the first generation of cryptocurrencies led to the birth of various cryptocurrencies today.

The blockchain technology that gave birth to cryptocurrency is the forerunner of the transformation of money from fiat to cryptocurrency (Viphindrartin et al, 2021). Sasongko et al (2021) explained that cryptocurrencies are an alternative currency in the future, although the level of stability is still uncertain at this time. In accordance with the findings of research by Sasongko et al (2021), Bawono & Prestianawati (2019) conducted research on the stability of various forms of money and found that crypto money tends to be unstable.

Zheng et al (2017) describe the characteristics of blockchain technology, namely decentralization, persistence, anonymity, and audibility. The nature of Decentralization is characterized by the validation of each transaction through a certain algorithm that maintains the data and network. The hallmark of persistence in blockchain technology is that every transaction that enters the blockchain cannot be deleted but can be validated if an error occurs. Everyone who transacts in blockchain technology does not reveal identity or anonymity which is the hallmark of Anonymity. Every transaction on the blockchain cannot occupy the previously used blockchain so it is limited and it is the audit nature of the blockchain so that each transaction can be validated and tracked digitally.

Swanson (2015) explains the crypto money mining process where every cryptocurrency miner must prove crypto ownership through a proof of work (Pow) or proof-of-stake (PoS) process in the process of proving and creating data on the blockchain requires computational energy which is often called hashes. So it can be said that crypto miners made a consensus on the blockchain on claiming ownership of the cryptocurrencies that were mined.

Beck et al (2018) explained that Blockchain technology, like the internet, is a critical technology today, and various organizations and commercial fields have adopted it to conduct transactions that are registered peer to peer by adopting blockchain technology. Blockchain technology can minimize uncertainty, insecurity, and ambiguity in transactions by fully disclosing all transactions in a blockchain transaction network. Pazaitis et al (2017) blockchain technology systems it is possible to adopt in more decentralized or more autonomous organizational systems. Regarding collaborative economics, Botsman (2015) explains that the concept of collaborative economics is a concept of sharing or collaborating economics where in the world today there are various industries that carry the concept of sharing or collaboration such as the share driving industry. Collaborative economics is currently a new socio-economic system order that uses the internet and blockchain technology systems for every transaction so that blockchain technology can become the technological foundation for collaborative economics. Ertz et al. (2019) explains that collaborative economics allows for the exchange of benefits for community ownership assets so that the community does not only act as users or consumers but also as suppliers and providers of resources to be used by others to earn financial income. exchange so that companies can become media in facilitating the community to carry out consumption activities and supply consumption tools. This is what underlies collaborative economics.

Belk (2014) Collaborative economy is a peer-to-peer-based economic system so that blockchain technology can become the technological basis for the development of a collaborative economy. Correa et al., (2019) explained that collaborative economic developments shift conventional economic systems or conventional businesses that disrupt or erode market-based economic systems. Botsman (2013) explains that the collaborative economy is currently changing the production and consumption system in a society where previously companies produced and society consumed, in a collaborative economy the production and consumption processes occur in society and companies act as mediators. Albinsson & Yasanthi Perera (2012) digital platforms that act as mediators in their line of business such as Uber which intermediaries vehicle owners to become drivers or share with others who need vehicles as a mode of transportation and Air Bnb which facilitates home or property owners to share with people in need of property are pioneers in the birth of the collaborative economy.

Acquier et al. (2017) explained that the increasingly massive collaborative economic process currently occurs in the digital world or online and the real world or offline. Various platforms have sprung up to support a collaborative economic system. De Reuver et al. (2018) digital platforms including such Uber & Airbnb have driven the development of a collaborative economy with community practices for collaboration and sharing among community members. Conceptually, the collaborative economy has similarities to the blockchain concept and blockchain technology is strongly supported by platforms that encourage and develop a collaborative economics environment.

Hypothesis Development

We examine and provide the findings of our research on the function role and consequences of blockchain technology for the collaborative economy in this part. Hawlitschek et al (2018) explained that there are three parties in the platform that facilitate collaborative economics, namely : Suppliers, Users, and Collaborative platforms.

Suppliers offer resources that are owned and usually excess resources or cannot be used by the owner, such as rooms that are not used and can be rented out on Airbnb, vehicles that can be used to serve passengers on Uber. Or resources that are intentionally provided by the owner to be rented or used by other parties with the motive of making a profit. Users generally want to use

the resources owned by the supplier, for example, they want to rent a room or want to get transportation facilities owned by the supplier to use. Collaborative platforms generally act as facilitators, providing a means of interaction and transactions between users and suppliers, maintaining network and security as well as developing trust between users and suppliers.

Technological development is the core of collaborative economics, this is explained by Dervojeda et al (2013), Hamari, et al (2016), and Ertz et al (2019). The development of digital technology is the main driver of economic collaboration. However, blockchain technology is no less important in creating a better platform environment. Baller et al (2016) explained that blockchain technology has the potential to drive progress on digital platforms that facilitate economic collaboration with secure monetization systems.

Internet technology and blockchain are two technologies that are inseparable in building a collaborative economics environment. Scott (2016), explains that blockchain technology plays a very important role in building a secure collaborative economics consensus. Scott's (2016) opinion is supported by Swan, (2015), Wright & De Filippi, 2015, and Huckle & White (2016). Blockchain technology plays a role in peer-to-peer transactions carried out by individuals who are members of the platform network.

Huckle et al. (2016) explained that blockchain technology can bridge independent transactions between individuals which validates each transaction easily and safely in every transaction in collaborative economics. Nowinski & Kozma, (2017) explain that the need for blockchain technology having the ability to be adapted to every line of transaction and industry in the modern era.

The development of digital technology currently leads to collaborative economic and peer-to-peer transactions. This is the basis in order to adopt of blockchain technology in the development of digital platforms that facilitate collaborative economics. Beck et al., (2018) described blockchain technology as being used to efficiently and securely manage and organize collaborative economics as well as social integration and social collaboration in a peer-to-peer and secure society. Blockchain technology also has the potential to eliminate intermediaries such as Airbnb or Uber in every transaction but this can happen following social changes over technological developments. Blockchain technology allows for collaborative economics without intermediaries so that it is more efficient. Blockchain technology will remain neutral and impartial so that it can be the basis for the development of collaborative economic technology and act as a driver of collaborative economic development.

Arsenault & Ertz, (2019) explained that in blockchain technology, governance is not owned by the developer but is decentralized and anonymous so it is very different from traditional collaborative economic development platforms such as Airbnb or Uber. Blockchain technology is neutral and is not owned by anyone, so all transactions and management are pure without intermediaries.

Mowers, (2019) reports that blockchain technology developments in cryptocurrencies are now accepted by global platforms as payment alternatives such as Amazon and eBay. The transformation of traditional transactions to blockchain allows for more efficient transactions because it does not depend on the development of intermediary platforms such as Uber, Amazon, eBay, and Airbnb. White (2017) explains that the savings from minimizing transaction costs occur with validated computing contracts through blockchain technology and governance. The savings are not only in transactions but also in labor costs, documentation costs, and various other savings. Dobrovnik et al (2018) explain that blockchain technology greatly benefits various

industries from the various savings created by blockchain technology. But it also threatens intermediary platforms such as Amazon and eBay.

Botsman & Rogers (2011) the trust factor is a central factor in the development of an economic collaborative technology environment. Cryptography allows every transaction on the blockchain to be disclosed and verified so that each transaction can avoid information uncertainty or ambiguity of information in each transaction. Baller et al (2016) the development of blockchain technology can change many things in the economy such as changes in the workforce where each individual can run his business with the resources they have and are peer to peer so that they can develop without depending on the company. Blockchain technology depends on user trust.

Blockchain and cryptocurrency technology can minimize the role of intermediaries so that transactions and transaction fees can be minimized. This is in accordance with the findings of a recent study of Zheng et al (2017)

Blockchain development continues to develop not only in cryptocurrencies but in various economic aspects and becomes a driver of collaborative economics. The results of our research through qualitative methods found that blockchain technology is changing the business model of intermediary platforms as an example Uber, Airbnb, eBay, and Amazon and has the potential to minimize transaction costs. The blockchain technology that is decentralized allows individuals to engage in transactions and of course, the development of blockchain technology encourages a collaborative economy where every individual in the community can act as a consumer and supplier. Block chain technology is ultimately dependent on internet users both in terms of benefit usage and crypto creation. In addition, consumption is a significant point in the development of the digital economy, where economic growth is the goal.

Research Method

In a 21-year data analysis from 2000 to 2020, "autoregressive vectors" were used to represent the causal link between variables. The World Bank contributed the data for this research. In this study, we look at internet users, consumption, and GDP use in Indonesia and Malaysia. The following multivariate regression model was used to investigate the causal association between variables internet users, consumption, and GDP in Indonesia and Malaysia:

$IUt = \beta_0 + \beta_1 CO_t + \beta_2 GDP_t + e_t$ eql 1

$COt = \beta_0 + \beta_1 IU_t + \beta_2 GDP_t + e_t$ eql 2

$GDPt = \beta_0 + \beta_1 IU_t + \beta_2 CO_t + e_t$ eql 3

Description :
IU : Internet user
CO : Consumption
GDP : Gross domestic product
e : error term
t : time series
β : the magnitude of the effect of causality
eql: equation

This study uses vector calculations where each regression relationship will be brought together so that each variable will alternately become the dependent variable and the independent variable. The zero theory of Dickey-Fuller, taken from the PP test, and p=1 is the formula in Δyt

$= (\rho - 1)y_{t-1} + ut$, in which Δ – for the first time different operators. This research used the following equation for the "unit root test":

$\Delta Y_1 = \alpha_0 + \beta_0 T + \beta_1 Y_{t-1} + \sum\_(i-1)^q \alpha_1 \Delta Y_{t-1} + e_t$

Description:

Y as the variable is being examined for unit root

T as the variable which indicates the “linear trend,” the “lag difference” means is $\Delta Yt-1$, $\alpha 0$ are shown as “constant term,” with the "t" as a "time trend" indicator. The following are the null hypothesis (h0) and alternative hypotheses for the "unit root test":

H0: $\alpha=0$

H1: $\alpha\neq0$

Result and Discussion

The first test that can be done on vectoring is to perform a data stationarity test or a unit root test. The utilization of data analysis in the form of time series is very dependent on the stationarity of the data. Researchers can use the ADF test to determine whether a circuit is not stationary or not. To assess whether the series is stationary, an error term analysis is performed, which includes the potential for autocorrelation if the series is not stationary. The following findings were achieved after running a unit root test:

Table 1. Unit Root Test on IU, CO, and GDP data

Variable	Unit Root	Include in the examination Equation	Statistics for the ADF Test	5% Critical Value	Description
Internet user (INAIU)	Level	Intercept	6.626153	1.0000	
	First Diff	Intercept	-0.254496	0.9143	
	Second Diff	Intercept	-7.999192	0.0000	Stationer
Internet user (MYIU)	Level	Intercept	-1.014848	0.7271	
	First Diff	Intercept	-4.177608	0.0049	Stationer
Consumption (INACO)	Level	Intercept	-1.137279	0.6796	
	First Diff	Intercept	-2.659896	0.0992	
	Second Diff	Intercept	-5.466068	0.0004	Stationer
Consumption (MYCO)	Level	Intercept	0.177438	0.9637	
	First Diff	Intercept	-5.243668	0.0005	Stationer
Gross domestic product (INAGDP)	Level	Intercept	-0.527808	0.8660	
	First Diff	Intercept	-1.929268	0.3129	

	Second Diff	Intercept	-3.319458	0.0293	Stationer
Gross domestic product (MYGDP)	Level	Intercept	-3.865460	0.0089	Stationer

The IU, CO, and GDP data from Indonesia (INA) are all stationary in the second difference, while the IU and CO variables from Malaysia (MY) are stationary at the first difference, but the GDP variable is stationary in the original data. This is indicated by the Augmented Dickey-Fuller Test, with a value of -3.865460 and a probability of 0.0089, because the probability is less than 5%, in this case, the GDP data shows stationary in the original data.

Both the VAR test and the causation test need the proper lag length sensitivity. Before beginning a VAR or causality test investigation, it is critical to choose an acceptable optimum lag duration. The lag test yielded the following results:

Table 2. Optimum lag test at Lag 0 to 2 IU, CO, and GDP data in Indonesia

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-157.1473	NA	4206.016	16.85761	17.00673	16.88285
1	-87.23888	110.3817*	7.040932*	10.44620	11.04269*	10.54715*
2	-78.17619	11.44760	7.652339	10.43960*	11.48345	10.61626

Table 2 shows the findings of the Optimum Lag test. At Lag 0 to 2, the results show that the variable lengths of lag IU, CO, and GDP in Indonesia are at LR, FPE, SC, and HQ at Lag 1. Because the findings of the five components are identical, then lag 1 will be chosen.

Table 3. Optimum lag test at Lag 0 to 2 IU, CO, and GDP data in Malaysia

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-170.0654	NA	16384.13	18.21741	18.36653	18.24264
1	-123.3078	73.82775*	313.7100*	14.24293*	14.83941*	14.34388*
2	-117.1825	7.737215	464.4893	14.54553	15.58938	14.72219

Table 3 shows the findings of the Optimum Lag test. At Lag 0 to 2, the results show that the variable lengths of lag IU, CO, and GDP in malaysia are at LR, FPE, AIC, SC, and HQ at Lag 1. Because the findings of the five components are identical, then lag 1 will be chosen.

Table 4. VAR Model Analysis in Indonesia

	INAIU	INACO	INAGDP
INAIU(-1)	1.159683	-0.025219	-0.090808
	(0.03255)	(0.03460)	(0.03203)
	[35.6294]	[-0.72895]	[-2.83494]
INACO(-1)	-0.054206	0.725031	-0.108300

	(0.12902)	(0.13714)	(0.12697)
	[-0.42013]	[5.28666]	[-0.85293]
INAGDP(-1)	-0.634759	-1.531717	0.534275
	(0.54471)	(0.57900)	(0.53606)
	[-1.16531]	[-2.64546]	[0.99667]
C	7.511917	27.37472	10.82449
	(10.5409)	(11.2044)	(10.3735)
	[0.71264]	[2.44321]	[1.04347]
R-squared	0.992260	0.826721	0.410251
Adj. R-squared	0.990808	0.794231	0.299673
Sum sq. resids	36.50918	41.24977	35.35878
S.E. equation	1.510571	1.605650	1.486581
F-statistic	683.6834	25.44550	3.710058
Log likelihood	-34.39709	-35.61790	-34.07691
Akaike AIC	3.839709	3.961790	3.807691
Schwarz SC	4.038855	4.160937	4.006838
Mean dependent	16.45492	68.97375	4.911251
S.D. dependent	15.75578	3.539653	1.776389

The relationship between IU and IU itself was significantly positive, with a coefficient of 1.159683 and a t-statistic of 35.6294. The relationship between IU and CO is significantly negative, with a coefficient of -0.025219 and a t-statistic of -0.72895, meaning that the lower the IU, the higher the CO. Likewise, the relationship between IU and GDP is significantly negative, with a coefficient of -0.090808 and a t-statistic of -2.83494, meaning that the lower the IU, the higher the GDP. This shows that the increase in internet users will push the level of consumption and economic growth which is represented by the GDP level variable in the opposite direction. Likewise, the relationship between CO and IU is significantly negative, with a coefficient of -0.054206 and a t-statistic of -0.42013, this indicates that a decrease in consumption will actually increase the growth of internet users per population in Indonesia.

Table 5. VAR Model Analysis in Malaysia

	MYIU	MYCO	MYGDP
MYIU(-1)	0.812752	0.038037	-0.020118
	(0.08757)	(0.04310)	(0.07781)
	[9.28160]	[0.88256]	[-0.25856]
MYCO(-1)	0.568004	0.924296	-0.076971
	(0.30204)	(0.14866)	(0.26838)
	[1.88056]	[6.21757]	[-0.28680]
MYGDP(-1)	0.383945	0.247319	-0.307578
	(0.39077)	(0.19233)	(0.34722)

	[0.98254]	[1.28592]	[-0.88583]
C	-22.93289	2.257189	11.76794
	(15.2626)	(7.51196)	(13.5617)
	[-1.50256]	[0.30048]	[0.86773]
R-squared	0.964631	0.918025	0.091051
Adj. R-squared	0.958000	0.902654	-0.079377
Sum sq. resids	209.5494	50.76195	165.4478
S.E. equation	3.618955	1.781185	3.215663
F-statistic	145.4593	59.72686	0.534252
Log likelihood	-51.87104	-37.69292	-49.50801
Akaike AIC	5.587104	4.169292	5.350801
Schwarz SC	5.786251	4.368438	5.549947
Mean dependent	59.63419	62.47874	4.344845
S.D. dependent	17.65863	5.708877	3.095167

The relationship between IU and IU itself was significantly positive, with a coefficient of 0.812752 and a t-statistic of 9.28160. The relationship between IU and CO is significantly positive, with a coefficient of 0.038037 and a t-statistic of 0.88256, meaning that the higher the IU, the higher the CO. Likewise, the relationship between IU and GDP is significantly negative, with a coefficient of -0.020118 and a t-statistic of -0.25856, meaning that the lower the IU, the higher the GDP. This shows that the increase in internet users will encourage economic growth which is represented by the variable level of GDP in the opposite direction. It is different from the level of consumption which moves in the same direction as the increase in internet users per population. Likewise, the relationship between CO and GDP is significantly negative, with a coefficient of -0.076971 and a t-statistic of -0.28680, this indicates that declining consumption in Malaysia will actually increase GDP.

Table 6. Granger Causality in Malaysia

H0:	Obs	F-Statistic	Prob.
MYCO does not Granger Cause MYIU	20	2.85400	0.1094
MYIU does not Granger Cause MYCO		1.22789	0.2832
MYGDP does not Granger Cause MYIU	20	0.24110	0.6297
MYIU does not Granger Cause MYGDP		0.97470	0.3374
MYGDP does not Granger Cause MYCO	20	2.17810	0.1583
MYCO does not Granger Cause MYGDP		0.99193	0.3332

The results of the Granger causality test analysis of variables in Malaysia can be seen in Table 4. The results show that there is not a single causal relationship that occurs between variables, this can be seen from the probability that none is less than five percent.

Table 7. Granger Causality in Indonesia

H0:	Obs	F-Statistic	Prob.

INACO does not Granger Cause INAIU	20	9.9E-05	0.9922
INAIU does not Granger Cause INACO		0.02302	0.8812
INAGDP does not Granger Cause INAIU	20	1.24169	0.2807
INAIU does not Granger Cause INAGDP		8.66977	0.0091
INAGDP does not Granger Cause INACO	20	6.68246	0.0193
INACO does not Granger Cause INAGDP		0.86383	0.3657

The results of the Granger causality test analysis in Indonesia can be seen in the table above. The results show that there are two causal relationships that occur between variables, namely the IU variable to GDP, and the GDP variable to CO, this can be seen from the probability that is less than five percent.

Internet users in Indonesia actually have a negative relationship with domestic consumption. This indicates that the majority of people in Indonesia tend to consume offline with the majority of the traditional economy. This is also reinforced by the negative correlation between internet users and economic growth. Consumption in Indonesia is also negatively correlated with economic growth in Indonesia. Where this shows the existence of cash inflow where the increase in income from consumption of Indonesian people flows out of the country. The country in Malaysia is positive, so the potential for using cryptocurrency in Malaysia is quite large, even though internet users and consumption have not supported GDP.

Conclusion

The readiness of the countries of Indonesia and Malaysia in the application of the digital economy has differences including the application of blockchain technology and crypto currency which is indicated by a causal relationship between internet users, domestic consumption, and economic growth. Although the two countries indicate that there has not been a digital economy boost in national economic growth, which is signed by the negative correlation between internet users and GDP in both countries, it can be concluded that both countries are more dominant in applying the traditional economy.

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