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**Editor in Chief Foreword**

In this issue, we receive articles from Italy, Tunisia, Indonesia, and France. We thank you for the trust given to us to continue to upgrade ourselves and improve the quality of our publications. We hope that international cooperation can continue to develop as knowledge and research are share for mutual progress. In this edition, we discuss the digital economy and economic challenges in the Asian region.

Thank you for all the hard work.

Best Regards  
Editor in Chief  
Dr Eny Lestari Widarni

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**OPENING SPEECH****Counselor Of STIE Jaya Negara Tamansiswa Foundation**

Alhamdulillah, thanks be to Allah SWT for the publication of the International Journal "Tamansiswa Accounting Journal International" which was written by contributors both from the academic community of STIE Jaya Negara Tamansiswa Malang and partner universities in Indonesia and abroad. This international journal, God willing, will be published in Indonesia and in 100 countries in the world. May Allah make the writing of the contributors as alms to the author, as well as make knowledge a blessing for all of us. Aamiin.

Malang, April 03, 2022  
Counselor Of STIE Jaya Negara Tamansiswa Foundation  
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**OPENING SPEECH****Registrar General of the Supreme Council  
The Tamansiswa Union**

Gratitude for the presence of Allah SWT, for the publication of the International Journal book "Tamansiswa Accounting Journal International". This international journal is the result of collaboration between STIE Jaya Negara Tamansiswa and triple nine communication Singapore and PT. Frost Yuniior.

Hopefully, this international journal is useful in the world of education and provides an example of the international collaboration strived by STIE Jaya Negara Taman Siswa as an effort to become an international standard university. Where prioritizing education as a medium of learning, spreading knowledge, skills and good habits to form good behaviour.

The hope is that this journal will be a motivation to improve self-quality and charity for writers from Indonesia and around the world, as well as making knowledge that is useful and a blessing for us all. Aamiin.

Malang, April 03, 2022  
Registrar General of the Supreme Council  
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that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

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## **Internet Consumption and Economic Growth in Malaysia's Post-Covid 19 Economic Recovery Efforts**

Amaury Capdeville Chapuzet<sup>1</sup>  
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### **Abstract**

This study intends to look into the link between home consumption, internet users, and economic growth in Malaysia as an effort to understand the condition of the three variables before the COVID-19 pandemic took place as an investigation of important indicators in efforts to recover the economy after the COVID-19 pandemic. We collected data from the world bank. We estimate the relationship between the variables of Education, Consumption, and Economic Growth in Malaysia using the Vector Autoregression (VAR) method in our research. We found that domestic consumption in Malaysia is important in driving economic growth and internet literacy in Malaysia. Domestic consumption before the Covid-19 era in Malaysia was a trigger for the increase in internet use in Malaysia as well as encouraging economic growth in Malaysia. It is important for Malaysia to consider increasing domestic consumption Malaysia using internet technology facilities in the pandemic and post-pandemic era as an effort to recover the Malaysian economy.

**Keywords:** Technology, Consumption, Economic Growth, Covid 19, Internet

**JEL Classification:** C10,E24,O33

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### **Background**

An unprecedented danger to the socioeconomic well-being of nations throughout the world is posed by the COVID-19 pandemic (Viphindartin, Wilantari, & Bawono, 2022). Alarming data, such as the number of COVID-19 cases and fatalities, is frequently published to help understand the severity of the toll. Many nations must take immediate action to safeguard the population's health and well-being. Everywhere there are job cuts. A record number of businesses have experienced revenue loss and bankruptcy, which has led to the loss of millions of jobs or layoffs (Rahman, Islam, & Islam, 2021).

A large number of workers in all parts of the value chain, as well as those working in the informal sector (especially women), face the most severe challenges, including a lack of social protection, including unemployment benefits. Both the government and the business world have an important role in preventing and minimizing the effects of abuses of human rights. A crisis in relation to entrepreneurship, as well as in ensuring measures aimed at the effect of economic recovery based on respect for human rights (Sajjad & Eweje, 2021).

The core of the quick response to the crisis and better rebuilding initiatives involve both commercial interests and human rights. It placed a focus on stopping and addressing the biggest human rights issues, especially in situations of poverty and discrimination. Notwithstanding the COVID-19 pandemic's unusual condition, actions may and should be founded on widely acknowledged human rights principles, such as the Guiding Principles. Here is a quick summary

of the three components that make up the Protection, Compliance, and Remedy framework of the Guiding Principles and are insufficiently covered in this note's summary of certain issues and recommendations for action (Flores & Rubin, 2022).

The COVID-19 epidemic persists, and various parts of the world experience the catastrophe in different ways. These resource records and listings will be updated regularly to reflect analysis, comprehension, and reaction to the crisis' effects on commerce and human rights (Lee & Haupt, 2021).

The first principle is based on the current human rights commitments recognized in international law and controls nations' duty to defend human rights. To fulfill their commitment to protecting human rights in cases of business-related violations, as outlined in the Guiding Principles (Bennoune, 2020).

The interests of workers, especially those who are most disadvantaged and vulnerable, must be taken into consideration in any steps made by the government to lessen the economic burden of the pandemic. During the COVID-19 epidemic, several countries made the appropriate choice to improve the support system for these populations. When reacting to the COVID-19 problem, nations should adopt an appropriate combination of legal and policy measures to demand and assist enterprises to respect human rights (Danielli, Patria, Donnelly, Ashrafian, & Darzi, 2021).

Since the start of the pandemic, there have been numerous reports of workers being forced to work in unsafe conditions, illegal dismissals, harassment of union leaders, and others raising the issue of a lack of personal protective equipment in the workplace (Brown, 2021). In the event of such a violation, in accordance with international human rights law, the victim must have access to effective remedies through legal procedures (Schormair & Gerlach, 2020). State grievance procedures that work well include both judicial and non-judicial, as well as non-state mechanisms, are essential to ensure that victims of human rights violations can seek redress (Wielga & Harrison, 2021). The effectiveness of such mechanisms is critical in times of crisis when they must address new pressing issues that need to be addressed (Boin, 2019).

An economic recovery after a pandemic is as dangerous as a person's recovery after the coronavirus (Koonin, 2020). When the worst is over, a real threat to health remains, and requires attention, and, if necessary, treatment. And for the economy, such a worrying symptom is accelerating inflation. This symptom cannot be ignored, policy tightening after last year's loose monetary policy period, needs to be done. If the economy is facing a pandemic and high inflation at the same time, then it will have to deal not only with temporary financial losses for citizens and companies and slowing growth. GDP, but also with inflation, which will eat up income (Kabadayi et al., 2020).

The world economy is suffering significant harm, particularly in developing nations, because of the coronavirus outbreak and the economic slump. The international community and developing nations may act now to hasten the end of the worst part of this health catastrophe and lessen its long-term harmful impacts (Huynh, Truong, Duong, Nguyen, Dao, & Dao, 2021).

Short-term responses to health emergencies and essential public service guarantees need to be complemented by comprehensive policies that actively promote long-term economic growth, including through improving governance and the business climate, expanding investment in education and health, and increasing effectiveness (Barbier, 2020).

Financing and building productive infrastructure are one of the biggest challenges in the post-pandemic recovery period (Aganbegyan, Klepach, Porfiryev, Uzyakov, & Shirov, 2020). A pandemic-driven economic downturn is likely to make decades of economic growth and productivity slowdown worse. These factors are crucial for raising living standards and lowering

poverty (Shingare & Kanoi, 2020). A further disparity caused by slowing economic growth is that the poor and vulnerable have been among the hardest hit by the pandemic and economic disruption, including through contagion, school closures, and reduced remittances (Olivia, Gibson, & Nasrudin, 2020).

The internet is one of the technologies that is still possible to assist economic recovery during the COVID-19 period and has the potential to help in post-covid-19 economic recovery (Sulisnaningrum, Widarni, & Bawono, 2022). The increase in domestic consumption is one of the tools to revive the economy through increasing the demand side by increasing social safety nets to help economically weak citizens to survive and continue to consume (Bawono, 2021). The impact of increased consumption is the impetus for increased production and has an impact on the movement of the economy (Widarni & Bawono, 2022).

This study intends to look into the link between home consumption, internet users, and economic growth in Malaysia as an effort to understand the condition of the three variables before the COVID-19 pandemic took place as an investigation of important indicators in efforts to recover the economy after the COVID-19 pandemic.

### Research Method

We collected data from the world bank. We estimate the relationship between the variables of Education, Consumption, and Economic Growth in Malaysia using the Vector Autoregression (VAR) method in our research, following the following equation model:

$$Y_t = C + A_1 Y_{t-1} + \dots + A_p Y_{t-p} + e_t$$

Where  $Y_t = (Y_{1t}, \dots, Y_{Kt})$  is the set of  $K$  time series of variables,  $c$  is  $K \times 1$  vector of constants,  $A$  is  $K \times K$  coefficient matrix and  $e_t$  is error terms.

This study focuses on the 20 pre-corona or 20 years before covid 19 became a pandemic based on past data sets for the period 2000 to 2019 with the assumption that variables outside of the main variables we studied did not change.

### Results and Discussion

We estimate the relationship between the variables of Education, Consumption and Economic Growth using Vector Autoregression with the estimation results presented in table 1.

**Table 1.** Vector Autoregression Estimation Results

	GDP	INTERNET_USER	CONSUMPTION
GDP(-1)	1.182331*	0.441121	0.032117*
	-0.14511	-0.09121	-0.02271
	[ 5.35121]	[ 0.03117]	[ 1.71211]
INTERNET_USER(-1)	-3211.211	0.241132*	372.2427
	-4117.24	-0.12114	-226.124
	[-0.55111]	[ 1.71121]	[ 1.71123]



CONSUMPTION(-1)	1.721141*	0.000291*	1.211261*
	-0.31411	0.00031	-0.23113
	[ 2.72211]	[1.31127]	[ 4.61112]
R-squared	0.983408	0.997414	0.999768
Adj. R-squared	0.974358	0.996003	0.999641

With a coefficient of 1.18233 and a t statistic of 5.35121, historical GDP has a sizable positive impact on present GDP. However, GDP has no effect on internet users in Malaysia. GDP has a direct impact on Malaysian consumption, with a 0.032117 coefficient and a 1.71211 t statistic. Internet users only have a significant effect on the internet users themselves with only a coefficient of 0.241132 and then a t-stat of 1.71121. Domestic consumption in Malaysia has significantly boosted internet usage and domestic consumption and has also boosted Malaysia's GDP. This is quite interesting because domestic consumption in Malaysia is an indicator of driving economic growth as well as driving internet literacy in Malaysia.

### Conclusion

Domestic consumption in Malaysia is important in driving economic growth and internet literacy in Malaysia. Domestic consumption before the Covid-19 era in Malaysia was a trigger for the increase in internet use in Malaysia as well as encouraging economic growth in Malaysia. It is important for Malaysia to consider increasing domestic consumption in Malaysia using internet technology facilities in the pandemic and post-pandemic era as an effort to recover the Malaysian economy.

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# COVID-19, Cryptocurrency Bubble and Cryptocurrency Market Efficiency in The World

Claudia Laura<sup>1</sup>

<sup>1</sup>European School of Economics, Italy

## Abstract

This study examines the effects of the epidemic and the price bubble on the effectiveness of the cryptocurrency market. In this Research, We collect the daily closing price of 5 cryptocurrencies from <https://coinmarketcap.com/>. The data was taken from 01 September 2017 to 14 December 2021 with a total data or sample of 1231 daily data from each currency or a total of 6155 samples from a total of all tested currencies. The five cryptocurrencies are Litecoin (LTC), Cardano (ADA), Ethereum (ETH), Ripple (XRP), and Bitcoin (BTC). To measure market inefficiency we use magnitude market inefficiency (MIM) and the study by Le Tran and Leirvik (2019) is used to establish the adjusted magnitude of market inefficiency (AMIM). In this study AMIMt is calculated on a daily frequency by using the daily closing price as the basis for calculation. We found that the three periods of the cryptocurrency bubble in the cryptocurrency market occurred in late 2017, early 2018, and July 2020. The cryptocurrency financial bubble had a lesser impact than the announcement of a worldwide pandemic being declared for COVID-19 on March 11, 2020. It is very likely that a bubble will occur during July 2020 related to the declaration that COVID-19 is a pandemic of global scope.

**Keywords:** Covid-19, Cryptocurrency, Cryptocurrency Bubble, Cryptocurrency Market Efficiency

**JEL Classification Code :** C02,C15,G11,G15

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## Introduction

As an alternative to funding the COVID-19 response agenda, the Covid-19 pandemic has fostered the study of finance and research in the area of finance (Baker et al., 2020). Financial sector analysis pertaining to Covid 19 is still scarce in the study of financial literature and financial technology (Corbet et al., 2020). Money has been transformed gradually following technological developments to date. The cryptocurrency was born as the newest form of money transformation of this century (Sebastiana et al, 2021). Le Tran and Leirvik (2020) discovered that the price of cryptocurrencies on the cryptocurrency market was in a bubble. But it's still unclear how stable the value of cryptocurrencies is. Sasongko et al. (2021) explained that the level of stability of cryptocurrencies still leaves a big question mark with the bubble period and various unexpected things in the cryptocurrency market.

Charfeddine and Maouchi, 2019 explain indications of the development of empirical research related to financial crypto currency and COVID 19. Charfeddine and Maouchi (2019) explain that market efficiency and development of cryptocurrency technology can be studied scientifically including the level of profit from investing in cryptocurrency. However, According

to Bariviera's (2017) research, the market was inefficient in the year before 2014 but has improved since then. Prior to 2017, the majority of cryptocurrencies were inefficient, according to Le Tran and Leirvik (2020). However, during the 2017-2019 period there was an improvement in crypto market efficiency. Wang and Wang (2021) researched the development of cryptocurrencies during the pandemic and found price bubbles and volatility in cryptocurrency prices.

Contrary to the conclusions of Charfeddine and Maouchi (2019), Bariviera (2017), Le Tran and Leirvik (2020), and Apergis Research (2021), the COVID-19 epidemic increases the volatility of cryptocurrency prices, which has a favorable impact just on conditional variance of returns on investments.

Based on previous research, there was a change in market efficiency at a certain period throughout the Covid-19 era, the market for cryptocurrencies had a fairly big price increase. This is the motivation of our research in answering research questions. How stable is the cryptocurrency market considering the Covid-19 pandemic? We using 5 cryptocurrencies as an indicator of price balance in the crypto market.

### Data and Research Method

In this Research, We collect the daily closing price of 5 cryptocurrencies from <https://coinmarketcap.com/>. The data was taken from 01 September 2017 to 14 December 2021 with a total data or sample of 1231 daily data from each currency or a total of 6155 samples from a total of all tested currencies. The five cryptocurrencies are Litecoin (LTC), Cardano (ADA), Ethereum (ETH), Ripple (XRP), and Bitcoin (BTC).

To test market efficiency, we use the return dynamics described by AR(q):

$$R_t = \mu + \beta_1 R_{t-1} + \beta_2 R_{t-2} + \dots + \beta_q R_{t-q} + E_t$$

$\beta_1, \beta_2, \dots, \beta_q$  is the coefficient of currency changes with a price of R and  $\mu$  is the initial price when the calculation starts in this study. In order to satisfy the efficient market hypothesis (EMH) in terms of price stability, the coefficients  $\beta_1, \beta_2, \dots, \beta_q = \text{Lim } 0$  or close to zero but not equal to zero. To test the market we use a vector of standard estimated coefficients designed with  $= (\beta_1, \beta_2, \dots, \beta_q) = L - 1\beta$ . To measure market inefficiency we use magnitude market inefficiency (MIM). With the following calculation formula:

$$MIM_t = \sum_{j=1}^q \beta_{jt}^s / 1 + \sum_{j=1}^q \beta_{jt}^s$$

MIM<sub>t</sub> has a value between 0 and 1. Value of MIM<sub>t</sub> Efficiency increases with distance from zero, but inefficiency decreases with distance from one. The second phase involves applying research by Le Tran and Leirvik (2019) and using the following calculation formula equation to get the adjusted magnitude of market inefficiency (AMIM):

$$AMIM_t = MIM_t - R_{CI} / 1 - R_{CI}$$

The market is indicated to be more efficient when the market is getting closer to zero and vice versa. In this study AMIM<sub>t</sub> is calculated on a daily frequency by using the daily closing price as the basis for calculation.

### Result and Discussion

In understanding the efficiency of the cryptocurrency market, table 1 is presented, below.

**Table 1. Assessments of the efficiency of static markets and descriptive statistics**

Cryptocurrency	Descriptive Statistic				Market efficiency tests			
	Mean	Max	Min	St.Dev	VR	R/S	GPH	ELW
Bitcoin [BTC]	0.17	20.41	-45.17	4.02	1.03	1.72	0.07	0.05
Ethereum [ETH]	0.09	23.22	-53.06	4.97	1.06	1.69	0.09	0.07
Ripple [XRP]	0.04	60.79	-54.97	6.21	1.18	1.29	0.17	0.10
Cardano [ADA]	0.19	85.89	49.27	7.39	1.13	1.79	0.11	0.13
Litecoin [LTC]	0.07	39.01	-45.05	5.48	1.07	1.49	0.10	0.11

To see the volatility of cryptocurrency prices on the market, we can look at the standard deviation in Table 1. Table 1 shows the lowest volatility (4.02%) in Bitcoin. Ethereum volatility 4.97%, Ripple volatility 6.21%, Cardano in 7.39% and Litecoin in 5.48%. The variance ratio statistic is abbreviated as VR. The three statistics used for the long memory test are R/S, GPH, and ELW. Based on the ratio variance, all cryptocurrencies studied have a ratio variance greater than 1. This shows that all cryptocurrencies studied in this study indicate an over-dispersed negative binomial distribution. R/S is Rescaled range analysis. In this study, Rescaled range analysis is used to investigate the rate of return. In Table 1. This shows that all cryptocurrencies have a rate of return on a time series of more than 1. This means that each crypto currency studied in this study on average can generate profits of more than 1 coin per time series period.

**Table 2. Cryptocurrency Market Efficiency**

Cryptocurrency	Whole Period		Non Bubble Period		Bubble Period		Pre - Pandemic Period		Pandemic Period	
	%ME	Median	%ME	Median	%ME	Median	%ME	Median	%ME	Median
Bitcoin [BTC]	44.707	0.021	31.591	0.031	47.111	0.001	4.187	0.221	65.917	-0.049
Ethereum [ETH]	44.337	0.021	17.776	0.201	48.936	0.002	7.212	0.232	63.512	-0.071
Ripple [XRP]	49.117	-0.014	10.112	0.149	56.117	-0.031	20.190	0.175	71.114	-0.131
Cardano [ADA]	45.991	0.019	39.619	0.251	51.101	-0.098	19.022	0.218	63.303	-0.018
Litecoin [LTC]	52.889	-0.015	32.999	0.257	55.001	-0.021	6.918	0.169	75.002	-0.112

In table 2, % ME denotes the frequency of efficient trading on the cryptocurrency market over the research period. The median is the average of many series measuring market efficiency. The findings of the AMIM criterion are shown in Table 2 as a percentage and a median market efficiency. We examined the overall period outcomes between the bubble and non-bubble periods, as well as between the time before and after the WHO designated the COVID-19 pandemic a worldwide pandemic.

The five cryptocurrencies under study are effective at more than half of the sample period's points, according to Table 2. Table 2 reveals that on March 11, 2020, the WHO declared COVID-19 to be a health pandemic, which had a significant impact on the efficiency of the

cryptocurrency market. The impact of this announcement has an impact until the end of the study period with a 50% change in inefficiency (median negative). The three periods of the cryptocurrency bubble in the cryptocurrency market occurred in late 2017, early 2018, and July 2020. The cryptocurrency financial bubble had a lesser impact than the announcement of a worldwide pandemic being declared for COVID-19. It is very likely that a bubble will occur during July 2020 related to the declaration that COVID-19 is a pandemic of global scope.

### Conclusion

The effectiveness of the bitcoin market is examined in this study in relation to the epidemic and the bubble of price movements. The three periods of the cryptocurrency bubble in the cryptocurrency market occurred in late 2017, early 2018, and July 2020. The cryptocurrency financial bubble had a lesser impact than the announcement of a worldwide pandemic being declared for COVID-19 on March 11, 2020. It is very likely that a bubble will occur during July 2020 related to the declaration that COVID-19 is a pandemic of global scope.

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# Foreign Investment, Infrastructure, and Public-Private Partnership in ASIA

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## Abstract

This study investigates private public partnerships (PPP) in Asia by panel analysis. We use data from the World Bank. We use the Panel Ordinary Least Squares (POLS) method. We found that foreign direct investment is more directed at developing real sector businesses rather than infrastructure development using the PPP system in ASIA countries. The lack of infrastructure in developing and low-income nations encourages the existence of public private partnerships to provide infrastructure in ASIA.

**Keywords:** Public-Private Partnership, Panel Data Analysis, Developing Countries, ASIA

**JEL Classification Code :** C01,C11,E10,E12

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## Introduction

Governments around the world are under constant pressure from the public to provide efficient and high-quality public services (Widarni, Drean, Bawono, 2022 ; Musaiyaroh & Bawono, 2018). Both state and local self-government agencies face a persistent dilemma about how to find a balance between meeting social obligations and ensuring quality with limited financial resources (Prestianawati, Syafitri, & Bawono, 2019). The provision of public services is directly proportional to the quantity and quality of public infrastructure which will inevitably age and wear out, so it is necessary to renew old infrastructure objects or create new infrastructure objects (De Groot & Lemanski, 2021). Organizing and carrying out the education and training process is the prerogative of the authorities (Ochoa-Mora & Bawono, 2021). Society demands higher quality educational services, but greater quality and efficiency cannot be expected without the number of more modern schools with adequate modern teaching tools (Dilova, 2021). Government institutions, with limited resources, are forced to look for other alternatives that will enable them to meet the needs of the community. The tool is a public and private sector partnership (Dewi & Wajdi, 2021).

Public-private sector partnerships are usually defined as collaborations between the public and private sectors, based on long-term contracts, in which the private sector provides services traditionally assigned to the competencies of the public sector and develops the necessary infrastructure for service delivery. Public-private partnerships are the “middle ground” between state management and privatization, which are used worldwide not only to attract additional external financing, but also to increase the efficiency of infrastructure use, reduce the cost of providing public services, attract private sector skills and knowledge, and ensure the opportunity for the public sector to pay more attention to the performance of their direct functions, regulate

service delivery, plan their development and objectives, and set quality standards (Tille, Panteli, Fahy, Waitzberg, Davidovitch, & Degelsegger-Márquez, 2021).

Traditionally, providing public services and developing public infrastructure is the prerogative of the public sector. An important feature of public services is the ability to use them for anyone who wants them, and the availability and price quality of services must also be ensured. Public infrastructure enables the provision of high quality and uninterrupted services. The mode of cooperation between the public and private sectors is motivated not only by the lack of investment in infrastructure development, but also by the need to improve the quality and efficiency of public services (Ndevu, 2021).

As noted in this work, public and private sector cooperation are widely applied in many countries of the world, but both international laws so far agree on a common definition of such cooperation. PPP can be defined as a form of contract between the public and private sector, which requires financial, technological, and expert knowledge from the private partner, where the management of the main risks of the project is transferred to the private sector, and the public sector pays the private partner for the provision of services to the public that has traditionally been provided by the public sector itself. A public-private partnership is a method of cooperation established by law between a state or municipal agency and a private entity, in which the state or municipal agency transfers the activities assigned to its functions to a private entity, and the private entity invests in these activities and the necessary property, for which he receives the reward prescribed by law (Fusacchia, Salvatici, & Winters, 2022).

Contractual PPP relationships share many of the characteristics of public procurement, but instead of buying fixed assets and paying full price up front, PPP mechanisms allow the public sector to create independent businesses that are financed and managed by the private sector (Liu, Clegg, & Pollack, 2022). Thus, public sector clients, depending on the form of PPP adopted, may be provided with high quality services for free or for a fee commensurate with the level and quality of service. In this way, public institutions do not lose property, as is the case in the case of privatization, but they create it and take it over after the expiration of the contractual relationship or renewal of the contract. Regardless of the form of PPP chosen, the project is executed on a contract basis (Churi, Pawar, & Moreno-Guerrero, 2021). PPP contracts are drawn up between public and private sector representatives. Most often, in PPP projects, a private company or consortium hires a construction company to carry out construction or reconstruction work and establishes a dedicated company to operate public infrastructure. In addition, banks or other investors are interested in financing PPP projects through private sector partners (Catalá-Pérez & de-Miguel-Molina, 2021).

Well-prepared projects based on PPP principles will pay off in the long run. Cost reductions and better quality are achieved in the implementation of infrastructure projects. Various studies show that PPP creates higher added value than traditional public procurement. However, if used incorrectly, it can produce negative results. In addition, public infrastructure created using PPPs may be more expensive, although this infrastructure is almost always of higher quality (Ndlovu & Newman, 2021).

The experience of many countries shows that cooperation between the public and private sectors, when projects that are needed by the community are financed by private capital and well implemented, can bring significant benefits to the country (Kaletnik & Lutkovska, 2021). Public sector opportunities expand when implementing PPPs. The public sector can, at the expense and initiative of the private sector, not only create the assets needed to provide public services, but



also entrust them with the provision of services associated with those assets (Onyoin & Bovis, 2022).

PPP projects that include infrastructure operation services provide a good incentive for the private sector to optimize full-term costs (Marques, Bastian-Pinto, & Brandão, 2021). Private sector participation means more than just the availability of additional funds and alternative sources of capital (Filatova, I., Nikolaichuk, L., Zakaev, & Ilin, 2021). At the same time, it can bring professional knowledge, management skills, innovation, efficiency, and greater effectiveness to the provision of public services, because in some cases the public sector is managed (managed) worse. This is not because public servants are managers who are not interested in efficient activities, but because the services provided by the public sector are monopolized, a monopolistic environment is formed, which does not encourage efficiency, and the personnel of public institutions is mainly trying to strengthen their power, increase the budget and do not care for the public interest (Crucke, Kluijtmans, Meyfrootd & Desmidt, 2022).

### Research Method

This study investigates private public partnerships (PPP) in Asia by panel analysis. We use data from the World Bank. Our descriptive variables are presented in table 1.

**Table 1.** Descriptive Variable

Variabes	Description	Source
Num PPP	Total of PPP Project	World Bank
GDP(to)PPP	Total investment in private public partnership (PPP) by GDP	World Bank
GenGovBal	General Government Balance	World Bank
TotalDebt	Government total debt	World Bank
AidPerCap	Aid Percapita in Country	World Bank
FuelExport	Country Fuel Export	World Bank
Population	Total Population in Country	World Bank
RGDPpercapita	Real GDP Percapita	World Bank
Inflation	Annual Inflation in Country	World Bank
MoneySupply	The Sum of Money Supply in Country	World Bank
FDI(to)GDP	Foreign Direct Investment Total percent of GDP	World Bank
TInv(to)GDP	Total Investment percent of GDP	World Bank

We use the Panel Ordinary Least Squares (POLS) method. with the following equation:

$$Y_{it} = \alpha + \beta X_{it} + u_t + \varepsilon_{it}$$

We use an equation where it is the panel notation over time and  $Y_{it}$  represents the outcome variable from the panel over time, the vector  $X$  is the control variable and  $u_t$  represents the year fixed effect. Statistical descriptions are presented in table 2.

**Table 2.** Descriptive Statistic

Variabes	Mean	Standart Deviasion
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Num PPP	7.21	7.38
GDP(to)PPP	0.07	0.12
GenGovBal	-2.31	-4.56
TotalDebt	60.35	81.59
AidPerCap	13.26	12.01
FuelExport	18.51	27.75
Population	15.06	0.58
RGDPpercapita	3198	2765
Inflation	33.59	40.98
MoneySupply	43.87	31.78
FDI(to)GDP	0.39	3.87
TInv(to)GDP	22.95	8.91

### Result and Discussion

Table 3 displays the outcomes of the POLS estimate.

**Table 3.** The results of POLS analyses

Variabes	Num PPP	GDP(to)PPP
GenGovBal	0.174* (0.011)	0.027** (0.001)
TotalDebt	0.039 (0.089)	-0.002 (0.499)
AidPerCap	0.001 (0.778)	0.001 (0.552)
FuelExport	-0.041 (0.218)	-0.007* (0.039)
Population	6.669* (0.01)	3.129*** (0.001)
RGDPpercapita	0.003*** (0.001)	0.002 (0.916)
Inflation	0.001 (0.304)	0.001 (0.514)
MoneySupply	0.228*** (0.002)	0.009** (0.006)
FDI(to)GDP	-4.113** (0.009)	- 0.128 (0.449)
TInv(to)GDP	0.119*** (0.001)	0.027** (0.001)

Note : Significance levels: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

Not all variables that become indicators in this study are related to PPP or have an insignificant relationship, namely foreign exchange reserves, real GDP per capita, and FDI as a percentage of GDP. The results of the POLS model have no problem with the estimation results. FDI shows a significant negative relationship between the number of PPPs and the total amount of investment in PPPs. This shows that foreign direct investment is more directed towards real sector business development than infrastructure development with the PPP system in ASIA countries.

The discovery of a significant correlation between the proportion of total investment and the quantity of PPP projects suggests that low-income and developing nations lack enough infrastructure. PPPs are necessary because of this infrastructural shortage.

### Conclusion

Foreign direct investment is more directed at developing real sector businesses rather than infrastructure development using the PPP system in ASIA countries. The lack of infrastructure in

developing and low-income nations encourages the existence of public private partnerships to provide infrastructure in ASIA.

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## **Sri Lanka's Green Policy Disaster and Investigation of the Green Economy and Human Capital in Sri Lanka**

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### **Abstract**

This investigation looks at how four important factors in Sri Lanka relate to environmental deterioration from 1985 to 2020: human capital, economic growth, infrastructure investment, and depletion of natural resources. We make use of secondary information gathered from the World Bank, Penn World, and the Global Footprint Network. The ARDL model was used to examine each variable. We discovered that, over time, economic expansion and the development of infrastructure have a positive association with CO<sub>2</sub>, but human capital and natural resources have a negative relationship with CO<sub>2</sub>. In order to preserve the environment, human capital plays a crucial role, and infrastructural development is necessary to boost the economy. Human capital investment is the most important thing in improving Sri Lanka's economy.

**Keywords:** Sri Lanka, Green Policy Disaster, Green Economy, Human Capital

**JEL Classification:** C10, E04, E44

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### **Background**

The country of Sri Lanka, in the post-covid-19 era as the country most affected by the energy crisis that hit the entire planet, amid the heat of falling oil prices for fear of a recession in the United States, has provided some respite (Tian, Yu, Xue, Zhuang, & Shan, 2022). Sri Lanka is a country that relies on imports to meet its needs for fuel, medicine, and even food (Wickramasinghe, 2011). First, following the Sri Lanka Civil War, which had a 30-year impact on the nation, and subsequently as a result of Rajapaksa family-driven infrastructure development initiatives, a clan that has held power in Sri Lanka for decades, the public deficit accumulated year after year with the country's debt growing steadily (DeVotta, 2016). With the arrival of the pandemic in 2020, Sri Lanka's main sector, namely tourism, collapsed (Ranasinghe, Sammani, & Perera, 2021). The loss of foreign currency inflows was a major blow to Sri Lanka's central bank. The shortage of reserves at the central bank due to efforts to contain the value of its currency makes it impossible to hold it any longer. Thus, the Sri Lankan currency began to fall (Robinson & Kengatharan, 2020).

Sri Lanka's depreciating currency, a broken economy and stifling debt, the outbreak of war in Ukraine, and the subsequent rise in prices were the final blow (MacDonald, 2022). Supply problems also began to worsen and a strong wave of protests began calling for the removal of the entire Rajapaksa family from power due to inflation and food and energy shortages in Sri Lanka (Premarathna, 2021). The Sri Lankan government has introduced rationing, asked residents not

to leave their homes, provided one day off a week for officials to work in their own gardens to feed themselves, and there were daily power cuts (Palipane & Pieris, 2022).

Sri Lanka's serious economic crisis, with its record inflation rate and possible non-payment of its financial obligations, has prompted families in the country to sacrifice food due to food shortages and high prices (Radhakrishnan, de Wit, Gopikumar, & Bunders, 2022). Not only food, family income is also affected by the crisis in Sri Lanka, where inflation rates have skyrocketed (Bhattacharya & Singh, 2021). The drastic decline in tourism due to the pandemic, with the country completely closed for months to a sector important to its economy, has been a further setback for Sri Lanka. Currently experiencing a severe economic crisis, the country of Sri Lanka has experienced a decline in foreign exchange reserves in the last two years and is drowned by high public and private external debt (George, George, & Baskar, 2022).

An unprecedented economic crisis hit the country of Sri Lanka. With growing food costs and staggering transportation costs, Sri Lanka has seen an annual rate of inflation (Bhattacharya & Singh, 2021). The Sri Lankan government imposed a state of emergency and sent troops all throughout the nation to keep order in the face of ferocious demonstrations (Pieris, 2021). The political dynasty Rajapaksa's irresponsible lending practices and the harm the Covid lockout had on Sri Lanka's tourist sector, is depleting Sri Lanka's foreign exchange reserves. Soon, Sri Lanka was unable to import necessities like food and gasoline or make debt payments (Li, Tjia, Yan, & Hung, 2021).

Actually, the riots were significantly influenced by the prohibition of fertilizer. In Sri Lanka, the agricultural industry is significant to the economy. The state imports synthetic fertilizers for this important business at a cost of hundreds of millions of dollars each year (Senadheera & Jeganathan, 2021). Rajapaksa told the state during his 2019 election campaign that the state will phase out these fertilizers and move to organic farming over a ten-year period. In April 2021, Rajapaksa expedited his intentions by abruptly banning synthetic fertilizers and pesticides. However, more than 90% of Sri Lankan farmers had used chemical fertilizers prior to the ban. After the ban, a staggering 85% experienced crop failure. Of course, the policy related to the ban on synthetic fertilizers by Rajapaksa suddenly destroyed Sri Lanka's economy, which is dependent on agriculture due to Sri Lanka's lack of green agricultural or organic farming infrastructure and people resources (Kataria, Manur, & Pradhan, 2022). Of course, the green economy needs careful preparation in making the transformation from the use of synthetic fertilizers to organic fertilizers (Drean & Bawono, 2021).

Pre-modern agricultural yields only natural foods for the majority of human history, and since food was so scarce, starvation was pervasive despite earlier populations being considerably smaller. One of humanity's finest accomplishments is the long-term decrease in malnutrition globally (McMichael, 2021). A number of groups, in particular environmentalists, aspire to convert the current global food system to an organic one. They believe that contemporary agriculture harms the environment and advocate switching to organic fertilizers like compost and dung that our ancient predecessors would have used. Nevertheless, conventional farming is not only important to feed everyone in the world, but it is also healthier for the environment in many ways (Wegner, Murray, Springmann, Muller, Sokolow, Saylor, & Morens, 2022). Organic farming uses natural fertilizers, which are more polluting than traditional synthetic ones. In addition to increasing yields and enabling people to grow more food on smaller plots of land, fertilizers and insecticides also enable people to farm more intensively. More land may be converted back to natural ecosystems, which are much more diversified than any farm, as

agricultural yields continue to rise. Organic farming promotes nature's recovery (Bux, Lombardi, Varese, & Amicarelli, 2022).

Conventional agriculture is growing more effective in wealthy nations, utilizing fewer inputs to produce more food. Fertilizer use has barely increased and pesticide use has decreased. The world is fed by conventional agriculture. Global agricultural output increased dramatically during the Green Revolution of the 1950s and 1960s, with food supply reaching about 3,000 kcal per day globally in 2017, up from more than 2,000 in 1961. Although hunger has returned, this time it is due to conflict, export restrictions, and bad government policies rather than a shortage of food production capability. The prohibition of fertilizers is not the only issue causing Sri Lanka's economy to suffer. The hasty implementation of the prohibition and the challenge of getting enough organic alternatives also contributed significantly to the harm (Pasqualetti, 2021). Sri Lanka is a country that has received enough attention after Covid 19. Sri Lanka with its controversial policies related to the environment and tax reductions has an impact on Sri Lanka's economy after Covid 19 (Ranasinghe, Sammani, & Perera, 2021). On the other hand, infrastructure development is needed to encourage Sri Lanka's economic growth (Fathima Rinosha, & Mohamed Mustafa, 2021). Therefore, this study investigates how environmental degradation is affected by human capital, economic growth, and infrastructure investment from 1985 to 2020 in Sri Lanka.

### Research Method

We make use of secondary data gathered from the World Bank, Penn World, and the Global Footprint Network. The econometric equation with ARDL model used in this study, which employs an annual period from 1985 to 2020, is as follows:

$$\Delta EC_t = \varphi EC_{t-1} + \beta_1 HCap_t + \varphi_1 \Delta HCap_{t-1} + \beta_2 GDP_{t-1} + \varphi_2 \Delta GDP_{t-1} + \beta_3 IInv_{t-1} + \varphi_3 \Delta IInv_{t-1} + \beta_4 NRes_{t-1} + \varphi_4 \Delta NRes_{t-1} + \varphi Dx_{t-1} + e_t$$

$$\Delta CO2_t = \varphi CO2_{t-1} + \beta_1 HCap_t + \varphi_1 \Delta HCap_{t-1} + \beta_2 GDP_{t-1} + \varphi_2 \Delta GDP_{t-1} + \beta_3 IInv_{t-1} + \varphi_3 \Delta IInv_{t-1} + \beta_4 NRes_{t-1} + \varphi_4 \Delta NRes_{t-1} + \varphi Dx_{t-1} + e_t$$

$e_t$  stands for error correction,  $\beta$  for long-term coefficient, and  $\varphi$  for short-term coefficient in the dynamic ARDL modeling models with the two parameters presented. To measure how quickly the imbalance is being corrected,  $Dx$  is used.  $EF$  is Ecological Footprint,  $EG$  is Economic Growth,  $HC$  is human capital,  $NR$  is Natural Resources Depletion,  $GX$  is Infrastructure Investment.

### Result and Discussion

We examine the sustainability of Sri Lanka's economy and environment using statistical analysis of the factors shown in Table 1.

**Table 1.** Descriptive data analysis

	Obs	Mean	Std.Dev	Min	Max
EC	36	0.282	0.071	0.225	0.375
CO2	36	11.011	1.993	6.991	14.522
Hcap	36	1.47	0.211	1.117	1.654
GDP	36	4.295	1.792	0.991	6.715
Iinv	36	22.992	17.011	3.192	59.981

NRes	36	1.195	0.399	0.71	1.901
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The descriptive statistics can be well illustrated in table 1 regarding the minimum, maximum, average, and standard deviation data for each variable. To get optimal results from the analysis, the optimal lag test is carried out which is presented in table 2.

**Table 2.** VAR lag order selection criterion

Lag	logL	LR	FPE	AIC	SC	HQ
0	-109.7112	NA	0.030211	8.091231	7.912432	7.972231
1	-11.34226	169.9224	0.000199	1.901192	2.992421	3.295622
2	10.92113	35.72324	0.0000337	1.272613	2.924424	2.092143

A lag duration of 2 is recommended by the majority of lag selection criteria. A stationarity test is necessary since the ARDL estimate requires steady data. Table 3 presents the stationarity test.

**Table 3.** Unit Root Test

PP Test						
	EC	CO2	GDP	IInv	HCap	NRes
t-Stat.	-1.5012	-1.0911	-2.4922	-4.8111	-1.2231	-1.7124
Prob.	0.3592	0.4912	0.0195	0.0061	0.5928	0.1928
First diff.	d(EC)	d(CO2)	d(GDP)	d(IINV)	d(HCap)	d(NRes)
t-Stat.	-3.8983	-5.0124	-11.9252	-13.9641	-5.9142	-3.9011
Prob.	0.0004	0.0000	0.000	0.0000	0.0000	0.0001
ADF Test						
	EC	CO2	GDP	IInv	HCap	NRes
t-Stat.	-1.1241	2.9242	2.4628	-3.0412	-1.9881	-1.0914
Prob.	0.3914	0.3114	0.0191	0.0039	0.5012	0.2021
First diff.	d(EF)	d(CO2)	d(EG)	d(GX)	d(HC)	d(NR)
t-Stat.	-2.1141	-4.7924	-8.0943	-6.0925	-6.1924	-4.0619
Prob.	0.0097	0.0000	0.000	0.0000	0.0002	0.0001

All variables were stationary at the initial difference, unit root tests determined by the outcomes of the PP test and ADF test. Table 4 displays the results of an ARDL limit test for EF and CO2 emissions.

**Table 4.** Bounds test

CO2		EC		
Test Stat.	Value	Test Stat.	Value	K
F-Stat.	4,582	F-Stat.	9,9226	4
Crit. Value				
Signif.	10 bound		11 bound	
10%	2.29		3.19	
5%	2.71		3.92	
2.5%	3.19		4.01	
1%	3.69		4.95	

The calculated F statistical values both for indicators exceed the upper bound at the 5% level of significance, indicating that the dependent variable is cointegrated with the independent variable in both models. The results of the dynamic ARDL estimate are shown in Table 5.



**Table 5.** The Dynamic ARDL Estimation Results

	CO2	EC
ECT	0.199	0.199
	1.79	2.09
HCap	-2.592	0.0129
	-2.94	1.89
HCap t-1	4.594	0.199
	1.89	1.71
GDP	0.299	0.192
	2.61	1.79
GDP t-1	0.401	1.902
	2.74	2.27
IInv	1.291	0.392
	0.91	1.89
IInv t-1	4.792	1.79
	1.92	3.19
NRes	-0.402	-0.203
	-1.99	-4.09
NRes t-1	-1.292	-0.0203
	-1.79	-2.01
N	35	35
R square	0.8117	0.8011

The acronym ECT in this study stands for error correction speed. It was evident from the dynamic ARDL data that ECT was important in both situations. CO2 is significantly impacted negatively by HC over time. According to the ARDL findings, both environmental damage indices were found to have a considerable beneficial impact on economic growth over the long and short terms. The Indonesian government's investment in infrastructure was shown to have a considerable beneficial impact on environmental damage indices. Economic growth and infrastructure development in Sri Lanka have an impact on environmental degradation in Sri Lanka which is enough to be a serious concern.

**Conclusion**

Over time in long term, CO2 has a bad relationship with natural resources and human capital, but a strong relationship with economic growth and infrastructure development. In order to preserve the environment, human capital plays a crucial role, and infrastructural development is necessary to boost the economy. Human capital investment is the most important thing in improving Sri Lanka's economy.

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## **Islamic Vs Conventional Economics, The Impact of Interest Rates on the Indonesian Economy**

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### **Abstract**

This study investigates the impact of interest rates and the economy in Indonesia as a country with a Muslim population in the world but does not prohibit interest rates in the positive laws of the Republic of Indonesia. The research period for this study is from 1990 to 2020, and we use secondary data that we collect from World Bank data. We use an autoregressive vector model. We found that The lower the interest rate, the more it encourages economic growth and vice versa. Interest rates put pressure on the real sector because interest rates are the cost of capital that weighs on the economy. Low interest rates bring improvement and better economic growth. This proves that interest rates which in Islamic economics are still forbidden have a bad impact on the Indonesian economy.

**Keywords:** Islamic Vs Conventional Economics, The Impact of Interest Rates, Indonesian Economy, Usuary

**JEL Classification:** C10,E04,E44

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### **Introduction**

World financial markets and commodity and currency prices have moved recently, based on interest rate expectations. The determination of interest rates is related to macroeconomic indicators, and this is true, but the fact is that interest rates, directly and indirectly, affect the daily life and personal finances of Humans (Wilantari, Widarni, & Bawono, 2021).

The primary instrument used by the central bank to modify the nation's monetary policy is interest rates, which are used to control the "money rate" (Varlik & Berument, 2017). Interest serves as insurance that money borrowed by a person or business won't be repaid, and the interest rate determines the cost of this insurance (Cororaton & Rosen, 2021).

Banks and other financial institutions base their interest rates for loans and savings on the base interest rate, which would be set either by central bank and represents the cost of interbank borrowing (Depren, Kartal, & Kılıç Depren, 2021). When the economy's inflation rate increases, increasing the cost of goods and services, the central bank boosts interest rates to make money more costly, which reduces lending to individuals and companies, consumer spending and demand, and inflation (Echarte Fernández, et al., 2021).

In the case of a financial crisis, the central bank lowers interest rates, lowers the cost of borrowing, boosts consumer spending as a result, and the economy picks up and leaves the crisis

behind (Aguir, 2018). Of course, this is conventional economic wisdom, although there are other factors that the monetary authorities take into account when setting interest rates, the most important are indicators of inflation or stagnation (Aganbegyan, 2020).

It takes roughly a year for the effects of interest rate adjustments to become noticeable and may then start to affect the economy and people (Jarociski & Karadi, 2020). When interest rates increase, loans become more expensive, businesses reduce their investments, while consumers reduce their spending (Agarwal & Chua, 2020). Likewise, when interest rates are lowered, yet prolonged access to cheap money might result in an economic bubble, the more it increases, the more painful its collapse (Shmelev & Ayres, 2021). The price of bonds that are issued by businesses and nations to borrow money from money markets is negatively correlated with changes in interest rates (Kisefáková, Filip, Onuferova, & Valentiny, 2020).

The exchange rate of the applicable currency rises when interest rates do as well, which is one indirect impact, which affects the direction of investors away from the stock and commodity markets to the currency market, and vice versa as well (Gu, Zhu, & Wang, 2022).

The jurists and commentators agree that usury is one of the last things prohibited by the Qur'an, and although scholars agree, then and now, about the prohibition of usury and its seriousness, they differ greatly in many respects (Abdullahi, 2021). Its branches and parts, such as the nature of usury and what is involved in it, what are the common causes of usury, and the hidden details of usury (El-Meouch, Fellner, Marosi, Szabó, & Urbán, 2020). When Islam forbids usury and strictly forbids it and fights the eater and all who deal with it, it only wants to eliminate the injustice it causes and thereby purify society from exploitation, hatred and the effects of this exchange. Sharia closes all places that lead to usury (Prabowo, Sulisnaningrum, & Harnani, 2021 ; Viphindrartin, Wilantari, & Bawono, 2022). In ancient economic thought, and since Greek times, Plato in his book *The Law*, forbade usury (Genc & Hassan, 2021), and Aristotle condemned usury and thought that money did not make money (Lewis & Kaleem, 2019). The early church was firm in its decision to prohibit usury and continued to do so until 1917 when the Vatican officially recognizes the legitimacy of interest (Van Boom, 2020).

The hatred of usury and moneylenders continued well after the French Revolution and the emergence of liberalism (Iyer, 2022). Where the theories that justify usury began to emerge, and they began to call it interest rates (Schefold, 2022). Some laws stipulate that it is permissible to charge a certain percentage that does not exceed 4% on a loan, which is called interest, if the interest exceeds the legal percentage, it becomes usury prohibited (Hartley & Kallis, 2021).

In 1974, the Consumer Credit Act was passed in the UK, according to which restrictions were lifted and interest rates (interest rates) were liberalized, and weak borrowers had to prove their exploitation before the courts, each according to the circumstances (Sparkes & Wood, 2021).

In America, usury laws have also been abandoned, since the 1980s, and a number of other countries have followed the same path. Thus, the distinction between usury and interest in legal and economic thought finally comes to an end. That's not exact discrimination, but maybe it's a stage on the way to legalizing usury or interest (Thiesenhusen, 2019).

From the description above, the distinction between usury and interest is not a correct distinction but is a stage in the historical development of the legalization of usury in the name of interest. The view of moneylenders in economic thought includes those dealing with interest in banks, as well as those dealing with usury from individuals, traders, or other people. This study investigates the impact of interest rates and the economy in Indonesia as a country with a Muslim population in the world but does not prohibit interest rates in the positive laws of the Republic of Indonesia.

### Research Method

The research period for this study is from 1990 to 2020, and we use secondary data that we collect from World Bank data. In estimating the variables we use an autoregressive vector model with the following equation:

$$\begin{aligned} \Delta C &= \beta_0 + \beta_1 C_{t-1} + \beta_2 GD_{t-2} + \beta_3 Inv_{t-3} + \beta_4 Itr_{t-4} + e_t \\ \Delta GD &= \beta_0 + \beta_1 C_{t-1} + \beta_2 GP_{t-2} + \beta_3 Inv_{t-3} + \beta_4 Itr_{t-4} + e_t \\ \Delta I &= \beta_0 + \beta_1 C_{t-1} + \beta_2 GD_{t-2} + \beta_3 Inv_{t-3} + \beta_4 Itr_{t-4} + e_t \\ \Delta IR &= \beta_0 + \beta_1 C_{t-1} + \beta_2 GD_{t-2} + \beta_3 Inv_{t-3} + \beta_4 Itr_{t-4} + e_t \end{aligned}$$

When Gross Domestic Product is represented by GD. Consumption is represented by C, investments by Inv, and interest rates by Itr.

### Result And Discussion

To guarantee that our data is steady for the estimate, we perform a data stationarity test.

**Table 1.** Results of a stationarity test

			Stat.	Prob.**
Fisher Chi-square			10.9824	0.1927
Choi Z-stat			0.6011	0.6943
	Prob.	Lag	Max Lag	Obs
CO	0.8761	0	3	30
GDP	0.8971	0	3	30
I	0.0201	0	3	30
IR	0.3012	0	3	30

The results in Table 1 indicate that all of the data are stationary so that we can estimate the vectors presented in Table 2.

**Table 2.** Estimation Outcomes

	CO	GDP	I	IR
				-
CO	0.19929	-0.89513	0.02011	0.00000000 0499
	-0.70111	-1.99211	-0.42215	-
	[ 0.29112]	[-0.50112]	[ 0.03011]	0.00000000 149
				[-0.41011]
				-
GDP	0.050882	0.201211	0.201113	0.00000000 000391
	-0.19274	-0.80121	-0.20116	-
	[ 0.30118]	[ 0.19811]	[ 1.19662]	0.00000000 0601
				[-0.79222]
I	2.01	3.97	0.0197	0.00000000

				00171
	-0.348	-1.27	-0.291	- 0.00000000 002
	[ 3.80515]	[ 2.94359]	[ 0.05926]	[ 2.02712]
IR	- 0.00000000 641	- 0.00000000 031	- 0.0000000001 9	-0.501
	- 0.00000000 17	- 0.00000000 7	- 0.0000000014	-0.394
	[-0.40451]	[-0.39324]	[-1.39461]	[-0.93249]
C	- 0.00000000 491	- 0.00000000 0297	0.0000000006 69	0.427
	- 0.00000000 107	- 0.00000000 0029	- 0.0000000000 7	-2.29
	[-0.50112]	[-0.89924]	[ 0.911121]	[ 0.20112]
R squared	0.76	0.71	0.759	0.71
R squared Adj.	0.72	0.69	0.73	0.63

Consumption significantly influences future consumption, according to the estimated outcomes of the autoregressive vector. Consumption is significantly impacted inversely by GDP. Consumption is significantly impacted favorably by investment. Consumption is significantly impacted inversely by interest rates. GDP is significantly impacted favorably by consumption. GDP is significantly impacted favorably by GDP. Investment is significantly impacted favorably by consumption. Investment is significantly impacted favorably by interest rates. Investment has a positive relationship with consumption. Interest rates are significantly impacted inversely consumption. Interest rates are significantly impacted inversely by GDP. Interest rates are significantly impacted inversely by investment. Interest rates are significantly impacted inversely to the interest rate itself.

### Conclusion

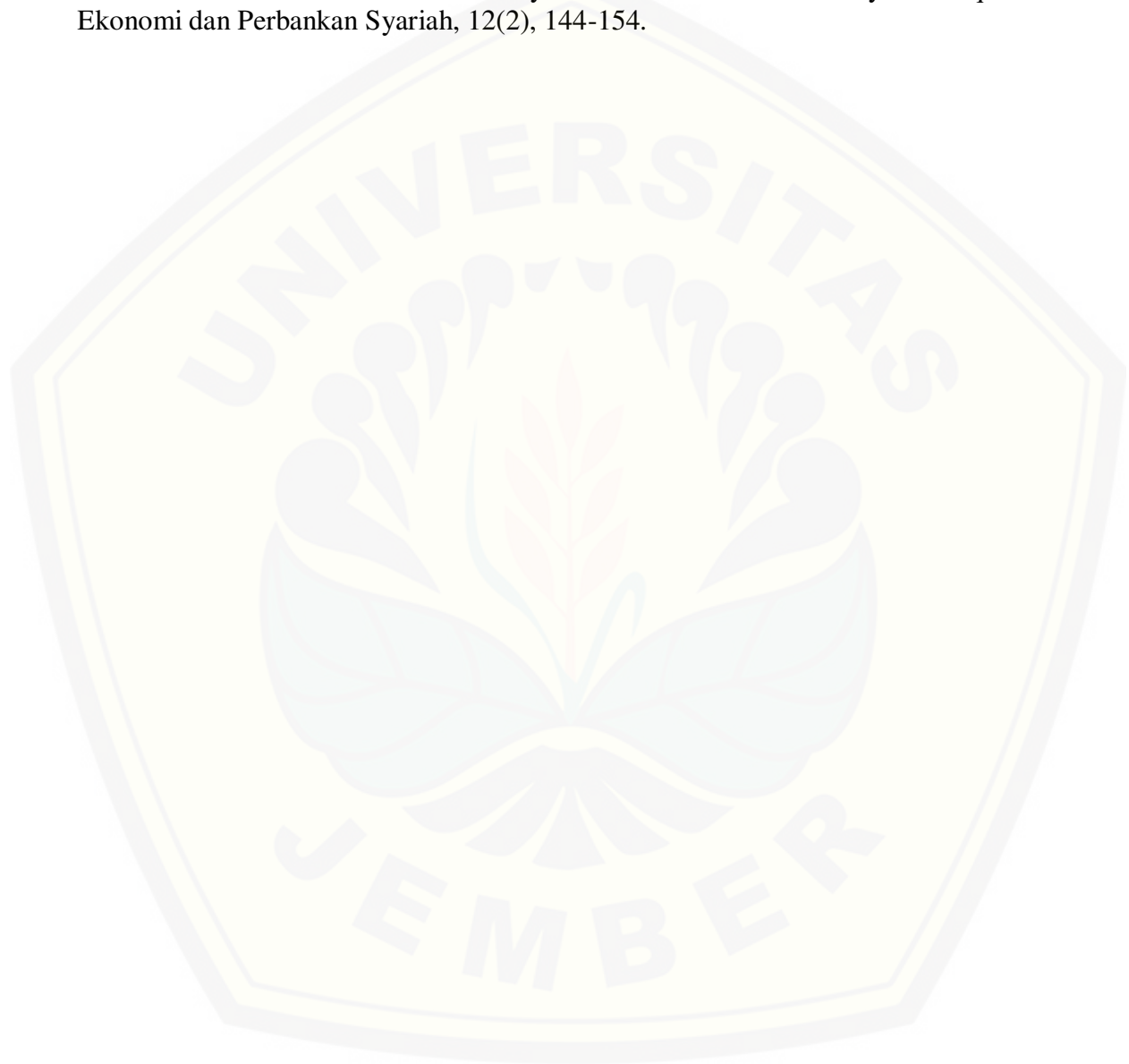
The lower the interest rate, the more it encourages economic growth and vice versa. Interest rates put pressure on the real sector because interest rates are the cost of capital that weighs on the economy. Low interest rates bring improvement and better economic growth. This proves that interest rates which in Islamic economics are still forbidden have a bad impact on the Indonesian economy.

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## The Role of Human Capital in Natural Sustainability and Economic Growth in Indonesia A Dynamic ARDL Approach

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### Abstract

This study aim to investigate the impact of economic activities on environmental sustainability in Indonesia. In this study, we use the variables of infrastructure, economic growth, and human capital to understand economic activity and the role of human capital in the economy and environmental sustainability. As a measure of environmental sustainability, we use indicators of carbon dioxide (CO<sub>2</sub>) and ecological footprint (EF) in Indonesia. This study uses annual time series data with a time period of 1985 to 2020. The data consists of various sources. The data is secondary data collected from the Global Footprint Network, Penn World, and World Bank. This research utilized the following two time-series models for the period from 1985 to 2020 for the following variables. The dependent variable in this study is the ecological footprint and CO<sub>2</sub> as an indicator of environmental damage. The independent variables in this study are the human capital index (HC), economic growth (EG), infrastructure (Gx), and natural resource depletion (NR) as indicators of economic activity and environmental changes as a result of economic activity. This study adopted the Dynamic ARDL model from Khan et al. (2020). The adoption of the ARDL model in this study aims to examine, simulate and predict the graph of shocks that occur in the independent variables. The results of the analysis using the ARDL approach show that in the long term human capital and natural resources have a negative relationship with CO<sub>2</sub>, while Economic Growth and infrastructure development have a positive relationship with CO<sub>2</sub>. Based on the ARDL results, it can be concluded that the role of human capital is very important in preserving nature and infrastructure development needs to be carried out while preserving nature or trying to minimize environmental damage.

**Keywords:** Islamic Finance, Deposit Interest Rate, Indonesia, Malaysia, Thailand

**JEL Classification:** C10, E04, E44

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### Introduction

Indonesia is a country with many islands and many green open lands such as forests and other valuable things in terms of environmental sustainability. However, Indonesia has a high risk of deforestation (Leijten et al, 2021). Zeng et al., (2020) explained that the goal of sustainable development is to protect the environment in a sustainable manner for the future. Environmental degradation problems that arise due to excessive resource consumption, mass production, reduced forests, and so on have an impact on climate change. In addition to climate change,

environmental degradation also causes health problems such as disease outbreaks and various other problems. Human consumption behavior has an impact on natural resource exploration (Elliott, 2006). Khan et al. (2020) explained that the use of natural resources needs to be done carefully and wisely. Economic activities such as consumption have an impact on the excessive use of natural resources. This can result in environmental degradation. The utilization of energy from nature such as the use of petroleum for motor vehicle fuel can produce carbon dioxide (CO<sub>2</sub>) which has an impact on climate change.

Apart from environmental problems as a result of increasing economic problems, the role of education as an important mechanism in the development of human capital also needs to be considered. Chankrajang and Muttarak (2017) explain that education has an impact on improving humans on the importance of preserving nature. In line with Chankrajang and Muttarak (2017), Ahmed and Wang, (2019) explain that increasing awareness through educational mechanisms in shaping human capital has an impact on the ecological footprint. Zafar et al., (2019) explained that the role of human capital in improving the economy also has an impact on environmental sustainability.

Carbon dioxide is one of the main components in the formation of the greenhouse effect which has an impact on environmental damage (Nasir et al., 2020). Strezov et al., (2017) explained that apart from carbon dioxide (CO<sub>2</sub>), the ecological footprint (EF) is a key index in measuring economic development and sustainable environmental sustainability. The ecological footprint can be used as a key indicator to calculate environmental deprivation. Carbon dioxide and ecological footprint are two important indicators in this study to measure economic development and environmental sustainability involving indicators of human capital, infrastructure, and economic growth.

Indonesia is an archipelagic country that is rich in natural resources (Pelzl & Poelhekke, 2021). Infrastructure development in Indonesia is increasingly massive to encourage economic growth (Jiya et al, 2020). However, the preservation of nature is a factor that is no less important than economic growth. Khan et al., (2020) explained that economic activities have an impact on the exploitation of nature and economic activities can increase carbon dioxide and degrade the environment. Environmental sustainability is very important for the survival of human life. In contrast to the research of Khan et al., (2020), Godil et al. (2021) found that economic development and activity can develop environmental and ecological conservation efforts in the long term.

These differences in empirical findings are the motivation for our research to investigate the impact of economic activities on environmental sustainability in Indonesia. In this study, we use the variables of infrastructure, economic growth, and human capital to understand economic activity and the role of human capital in the economy and environmental sustainability. As a measure of environmental sustainability, we use indicators of carbon dioxide (CO<sub>2</sub>) and ecological footprint (EF) in Indonesia.

## **Literature Review**

Indonesia's natural preservation is very important for the world because Indonesia is one of the oxygen-producing countries for the world. However, Indonesia also needs to grow and develop economically as a nation (Cahyaningsih et al., 2021; Maxton-Lee, 2020). Sodri & Garniwa (2016) explained that sustainable environmental sustainability is very important and the reduction of environmental degradation needs to be done in economic development. Carbon dioxide and ecological footprint are two indicators that can be used to measure environmental sustainability.

Padhan et al., (2020) explained that the process of burning non-renewable energy such as coal and other economic activities that produce carbon dioxide has an impact on deteriorating the environment and increasing global warming. Adedoyin and Zakari (2020) confirm the findings of Padhan et al. (2020) by finding that there is a process of energy consumption in economic activities increasing carbon dioxide in the air which has an impact on deteriorating environmental quality. Atil et al. (2020) explained that natural resources are important to protect. The natural resources make a significant contribution to economic growth as well as to increase carbon dioxide. Danish et al.,(2019) explained that the exploitation of natural resources and economic activities affect the ecological footprint and has an impact on environmental quality degradation. The ecological footprint is a measure of impact, environmental pollution and energy consumption from economic activities.

Danish et al. (2019) explain that an increase in industrial activity in the economy increases the exploitation of natural resources which has an impact on the environment. Yao et al. (2020) explained that the development of human capital has an impact on environmental preservation as well as encouraging economic growth. Rusmingsih et al. (2021) explain that human capital can be developed through increased education and has an impact on human psychology to be more sensitive to the environment while improving the performance of human resources. Ahmed et al. (2020) explain that educated human resources are more aware of environmental sustainability. So it can be said that human capital plays an important role in the economy and environmental sustainability. Mangone (2016) explains that Infrastructure in addition to acting as a driver of economic growth also has an impact on the environment. Human capital and infrastructure are interrelated in promoting economic growth and having an impact on environmental sustainability. Danish et al. (2019) explain that economic growth has a significant impact on increasing the ecological footprint and environmental degradation. Destek and Sarkodie (2019) in their research strengthen the findings of Danish et al. (2019) where the research by Destek and Sarkodie (2019) found a relationship between economic growth and the ecological footprint.

### Research Method

This study uses annual time series data with a time period of 1985 to 2020. The data consists of various sources. The data is secondary data collected from the Global Footprint Network, Penn World, and World Bank. This research utilized the following two time-series models for the period from 1985 to 2020 for the following variables. The dependent variable in this study is the ecological footprint and CO<sub>2</sub> as an indicator of environmental damage. The independent variables in this study are the human capital index (HC), economic growth (EG), infrastructure (Gx), and natural resource depletion (NR) as indicators of economic activity and environmental changes as a result of economic activity.

$$EF_t = \beta_0 + \beta_1 HC_t + \beta_2 EG_t + \beta_3 Gx_t + \beta_4 NR_t + e_t$$

$$CO2_t = \beta_0 + \beta_1 HC_t + \beta_2 EG_t + \beta_3 Gx_t + \beta_4 NR_t + e_t$$

The long-term relationship between research variables was examined by cointegration using the calculated F-statistical value as the basis for drawing conclusions whether or not there is cointegration between research variables. The conclusion of whether there is cointegration between the dependent and independent variables is based on the following two hypotheses:

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$$

$$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$$

If there is a cointegration relationship between the research variables based on the two hypotheses above, then a long-term and short-term relationship between the research variables is tested with the following equation:

$$\Delta EF_t = \beta_0 + \beta_1 EF_{t-1} + \beta_2 HC_{t-1} + \beta_3 EG_{t-1} + \beta_4 GX_{t-1} + \beta_5 NR_{t-1} + \sum_{i=1}^q \beta_6 \Delta EF_{t-1} + \sum_{i=1}^q \beta_7 \Delta HC_{t-1} + \sum_{i=1}^q \beta_8 \Delta EG_{t-1} + \sum_{i=1}^q \beta_9 \Delta GX_{t-1} + \sum_{i=1}^q \beta_{10} \Delta NR_{t-1} + e_t$$

$$\Delta CO2_t = \beta_0 + \beta_1 CO2_{t-1} + \beta_2 HC_{t-1} + \beta_3 EG_{t-1} + \beta_4 GX_{t-1} + \beta_5 NR_{t-1} + \sum_{i=1}^q \beta_6 \Delta EF_{t-1} + \sum_{i=1}^q \beta_7 \Delta HC_{t-1} + \sum_{i=1}^q \beta_8 \Delta EG_{t-1} + \sum_{i=1}^q \beta_9 \Delta GX_{t-1} + \sum_{i=1}^q \beta_{10} \Delta NR_{t-1} + e_t$$

In the above equations,  $\beta_1$  to  $\beta_{10}$  are the elements to be examined based on F statistical calculations. If there is cointegration in the research variables, then proceed with short-term and long-term dynamic ARDL simulation models. This study adopted the Dynamic ARDL model. Khan et al. (2020). The adoption of the ARDL model in this study aims to examine, simulate and predict the graph of shocks that occur in the independent variables. Jordan and Philips (2018) explain that the dynamic ARDL simulation model can be used if there is a cointegration relationship between research variables. The following ARDL model we use:

$$\Delta EF_t = \varphi EF_{t-1} + \beta_1 HC_t + \varphi_1 \Delta HC_{t-1} + \beta_2 EG_{t-1} + \varphi_2 \Delta EG_{t-1} + \beta_3 GX_{t-1} + \varphi_3 \Delta GX_{t-1} + \beta_4 NR_{t-1} + \varphi_4 \Delta NR_{t-1} + \varphi Dx_{t-1} + e_t$$

$$\Delta CO2_t = \varphi CO2_{t-1} + \beta_1 HC_t + \varphi_1 \Delta HC_{t-1} + \beta_2 EG_{t-1} + \varphi_2 \Delta EG_{t-1} + \beta_3 GX_{t-1} + \varphi_3 \Delta GX_{t-1} + \beta_4 NR_{t-1} + \varphi_4 \Delta NR_{t-1} + \varphi Dx_{t-1} + e_t$$

The two equations above are dynamic ARDL simulation models where  $\beta$  is the long-term coefficient and  $\varphi$  is the short-term coefficient,  $e_t$  is the error correction.  $Dx$  is applied to check the speed of adjustment of the imbalance.

### Result and Discussion

Descriptive statistics related to Indonesia for the variables of the study are presented in Table 1.

**Table 1.** Descriptive statistics

Variable	Obs	Mean	Std.Dev	Min	Max
EF	36	0.391	0.068	0.316	0.496
CO2	36	10.923	2.033	7.112	15.941
HC	36	1.59	0.188	1.229	1.769
EG	36	4.314	1.816	1.009	6.926
GX	36	23.559	16.787	3.278	60.115
NR	36	1.226	0.441	0.63	2.081

The results of the descriptive statistics are expressed in the minimum value (Min), the average value (mean), and the maximum value (Max). EF Min 0.316, EF Mean 0.391, EF Max 0.496, CO2 Min 7.112, CO2 Mean 10.923, CO2 Max 15.941, HC Min 1.229, HC Mean 1.59, HC Max 1.769, EG Min 1.009, EG Mean 4.314, EG Max 6.926, Gx Min 3.278, GX Mean 23.559, GX Max 60.115, and NR Min 0.63, NR Mean 1.226, NR Max 2.081. EF is Indonesia's ecological footprint, CO2 is Indonesia's carbon dioxide emissions, HC is Indonesia's human capital index,

EG is Indonesia's gross domestic product, GX is Indonesian government investment in infrastructure, and NR is natural resource depletion. Table 2 shows the results of the VAR lag order selection criteria.

**Table 2.** VAR lag order selection criteria.

Lag	logL	LR	FPE	AIC	SC	HQ
0	-111.8567	NA	0.021125	7.888612	8.271573	8.151154
1	-12.45817	172.1816	0.000213	2.233371	3.151156	3.336751
2	11.18725	36.81213	0.0000446	1.381762	3.031113	2.131322

Most lag selection criteria suggest a lag length of 2. In this study, the Phillip-Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests were used in the stationarity test which are presented in Table 3.

**Table 3.** Unit Root Test

Unit root test table (PP)						
at level with constant	EF	CO2	EG	GX	HC	NR
t-Statistic	-1.468	-1.1228	-2.5131	-4.7362	-1.1124	-1.8215
Prob.	0.3667	0.5363	0.0214	0.0059	0.5519	0.2014
At first difference with constant	d(EF)	d(CO2)	d(EG)	d(GX)	d(HC)	d(NR)
t-Statistic	-3.9114	-4.9513	-12.3716	-14.1757	-6.1268	-4.1256
Prob.	0.0005	0.0000	0.000	0.0000	0.0000	0.0002
Unit root test table (ADF)						
at level with constant	EF	CO2	EG	GX	HC	NR
t-Statistic	-1.2152	3.3321	2.5737	-2.7531	-2.3112	-1.1532
Prob.	0.4432	0.2326	0.0127	0.0043	0.4481	0.1487
At first difference with constant	d(EF)	d(CO2)	d(EG)	d(GX)	d(HC)	d(NR)
t-Statistic	-2.2253	-4.8513	-8.1165	-6.1136	-6.2813	-4.1723
Prob.	0.0114	0.0000	0.000	0.0000	0.0005	0.0003

The Phillip-Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests show the stationarity of all variables in the first difference. Dynamic ARDL cointegration testing is important to do using the ARDL bounds test. Table 4 shows the results of the ARDL bounds test for EF, and carbon dioxide (CO2) emissions.

**Table 4.** ARDL bounds test

CO2		EF		
Test Statistic	Value	Test Statistic	Value	K
F-Statistic	4,693	F-Statistic	10,5517	4
Critical Value Bounds				
Significance	10 bound		11 bound	
10%	2.45		3.52	
5%	2.86		4.01	
2.5%	3.25		4.49	
1%	3.74		5.06	

At the 5% significance level, the estimated F statistical values for both indicators are outside the upper limit; it reveals that the dependent variable of both models is cointegrated with the independent variable. The dynamic ARDL findings are as presented in Table 5.

**Table 5.** The dynamic ARDL

	CO2	EF
ECT	0.212	0.239
	1.81	1.91
HC	-2.616	0.0131
	-3.15	2.11
HC t-1	4.616	0.212
	1.96	1.92
EG	0.321	0.228
	2.59	1.88
EG t-1	0.399	1.897
	2.85	2.16
GX	1.312	0.439
	0.87	1.91
GX t-1	4.838	1.86
	1.89	3.26
NR	-0.397	-0.121
	-2.16	-3.81
NR t-1	-1.379	-0.0115
	-1.81	-1.98
N	35	35
R square	0.7939	0.7626

In this study, that error correction speed, is denoted by the term ECT. Based on the dynamic ARDL results, it was shown that ECT was significant in both cases. The ECT values were 0.212 for carbon dioxide emissions and 0.239 for EF, respectively. Since the value lies between 0 and 1, it can be concluded that the equilibrium shock is adjusted in one year for both environmental degradation variables.

Based on the results of dynamic ARDL, HC in the long term has a significant negative impact on CO2 with a coefficient value of 2.616 but has a significant positive impact on EF with a coefficient value of 0.0131. In the short-term HC relationship, it has a positive direction towards CO2 with a coefficient value of 4.616 each and EF with a coefficient value of 0.212 each.

Based on ARDL results both in the short term and long term on both indicators of environmental damage, it was found to be significantly positive for economic growth (EG), namely 0.321 for CO2 and 0.228 for EF. In the short term, the coefficient values are 0.399 for CO2 and 1.897 for EF.

Based on ARDL results in both the short and long term, both indicators of environmental damage were found to be significantly positive for the Indonesian government's investment in infrastructure (GX), namely 1.312 for CO2 and 0.439 for EF. In the short term, the coefficient values are 4.838 for CO2 and 1.86 for EF. In the long run, the NR coefficient for CO2 is 0.397 and the EF is 0.121. In the short term, the coefficient of CO2 is 1.379, and for EF the coefficient is 0.0115. The overall explanatory power was higher for the CO2 model with an r-value of 79% compared to 76% for the EF model.

### Conclusion

Indonesia is a country with a large enough open green space, especially on islands outside Java, so it is very important to preserve Indonesia's nature as a supplier of world oxygen. On the other hand, infrastructure development is quite massive in 2019-2021 in Indonesia to encourage

economic growth. Therefore, this study examines how Natural Resources Depletion (NR), human capital (HC), Economic Growth (EG), and Infrastructure Investment (GX) affect environmental degradation from the perspective of two important indicators, namely, Ecological footprint (EF) and CO<sub>2</sub> from 1985 to 2020. The results of the analysis using the ARDL approach show that in the long term human capital and natural resources have a negative relationship with CO<sub>2</sub>, while Economic Growth and infrastructure development have a positive relationship with CO<sub>2</sub>. Based on the ARDL results, it can be concluded that the role of human capital is very important in preserving nature and infrastructure development needs to be carried out while preserving nature or trying to minimize environmental damage.

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# Public-Private Partnership (PPP) Projects in Low-Income and Developing Countries in Asia, Europe, Africa, And South America: Panel Data Analysis

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## Abstract

This study investigated PPP in 129 low-income and developing countries in Asia, Europe, Africa, And South America during the period between 1990 to 2020 with panel analysis. In this study, we used statistics and regression coefficients using the Panel Ordinary Least Squares (POLS) method, We used Feasible Generalized Least Squares (FGLS) regression to triangulate the POLS. We found that governments of low-income and developing countries need increased savings in GDP. The finding of a positive relationship between the share of total investment and the number of PPP projects indicates a lack of infrastructure in low-income and developing countries. The need for additional capital in developing countries encourages low-income and developing countries to encourage PPPs.

**Keywords:** Macroeconomics, Public-Private Partnership, Panel Data Analysis, Developing Countries

**JEL Classification Code :** C01,C11,E10,E12

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## Introduction

Infrastructure development is very important in improving people's welfare which is indicated by economic growth (Musaiyaroh & Bawono, 2018). However, many infrastructure developments fail in developing countries (Mansaray et al, 2021). In infrastructure development to encourage economic growth requires investment in infrastructure (WIDARNI & BAWONO, 2021).

Amos & Zanhoun (2019) explained that low-income countries tend to look for alternative financing due to budget constraints and high levels of debt. Yurdakul & Kamasak, (2021) found that Public-Private Partnership (PPP) as an alternative to state financing in building various infrastructure and other development projects is increasingly popular. Jermias & Yigit (2019) explain that companies involved in the Public-Private Partnership (PPP) must be willing to bear the risks arising from the Public-Private Partnership (PPP). Boyer & Scheller (2018) explained that macroeconomic stability is an important factor for companies in making decisions about their involvement in the Public-Private Partnership (PPP).

The need for additional capital in developing countries encourages low-income and developing countries to encourage PPPs. However, low-income and developing countries often face macroeconomic and political instability that pushes the private sector to withdraw from projects. Low-income and developing countries generally get investment because of the natural resources in their country (Hammami et al., 2006).

The macroeconomic variables that we use in the indicators in our investigation include GDP, per capita income, general government balance, total debt, inflation, money supply, and activities of Public-Private Partnership with World data sources. Development Indicators (WDI).

**Literature review**

Public and private partnerships are an alternative in increasing the efficiency of the government's budget and investment capital. Public and private partnerships have the potential to create transfers of expertise and technology that further strengthen the efficiency of the country (Bajwa et al., 2018).

Public and private partnerships have the potential to increase the prosperity of the country and have the potential to provide many benefits for the country. However, public and private partnerships have a risk of failure that must be managed properly (Engel et al., 2014). PPP provides benefits in the form of optimization of government budgets and efficiency of government budgets in developing countries (Donaldson & Hornbeck, 2016).

As a rule, PPP mechanisms are used to implement long-term projects in the field of creation and maintenance of public infrastructure facilities. Most often, the investor takes part in the financing of the project, the creation/reconstruction of the infrastructure facility, the operation/maintenance of the infrastructure. PPP contracts become quite challenging because they must combine the public interest and profit motive interests for the private sector (Sharma, 2012).

**Research Method**

This study investigated PPP in 129 low-income and developing countries in Asia, Europe, Africa, And South America during the period between 1990 to 2020 with panel analysis. We use data from the World Bank. We focus on macroeconomic variables collected from the World Development Indicators (WDI) provided by the World Bank which we present in Table 1. Table 2 presents descriptive statistics,

In this study, we used statistics and regression coefficients using the Panel Ordinary Least Squares (POLS) method. with the following equation:

$$Y_{it} = \alpha + \beta X_{it} + u_t + \varepsilon_{it}$$

We use an equation where it is the notation of the panel over time and  $Y_{it}$  represents the outcome variable from the panel over time, the vector  $X$  is the control variable and  $u_t$  represents the year fixed effect. We used Feasible Generalized Least Squares (FGLS) regression to triangulate the POLS results to retest the results of the POLS estimates.

**Result and Discussion**

Based on the regression results in Table 3, it indicates that the determinants of PPP activities include the general government balance with a coefficient value of 0.027 and a p-value < 0.01, a population with a coefficient value of 3.129 and a p-value < 0.001, exports of materials fuel with a coefficient value of 0.007 and p-value < 0.05, the money supply with a coefficient value of 0.009 and p-value < 0.01 and the share of total investment in GDP with a coefficient value of 0.027 and p-value < 0.01.

Not all variables that become indicators in this study are related to PPP or have an insignificant relationship, namely real GDP per capita, international reserves, and the share of FDI in GDP. We used Feasible Generalized Least Squares (FGLS) regression to triangulate the POLS which we presented in table 4. The regression results using the Feasible Generalized Least Squares regression method and the results from the POLS model are similar which means that there are no problems with the POLS estimation results.

FDI shows a significant negative relationship to the number of PPP and the Total amount of investment in PPP. This finding shows that Governments of low-income and developing countries need increased savings in GDP

The finding of a positive relationship between the share of total investment and the number of PPP projects indicates a lack of infrastructure in low-income and developing countries. The need for additional capital in developing countries encourages low-income and developing countries to encourage PPPs.

### **Conclusion**

Governments of low-income and developing countries need increased savings in GDP. The finding of a positive relationship between the share of total investment and the number of PPP projects indicates a lack of infrastructure in low-income and developing countries. The need for additional capital in developing countries encourages low-income and developing countries to encourage PPPs.

### **Limitation**

This study focuses on macroeconomic indicators in understanding PPP activity in low-income and developing countries. This study is limited to the data available on the World Bank data. Further research is needed with qualitative methods that examine each region or country to clarify the findings of this study

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### Attachment

Table 1. Descriptive Variable

Variabes	Description	Source
Num PPP	Number of PPP Project	World Bank
GDP(to)PPP	Total amount of investment in PPP	World Bank
GenGovBal	General Government Balance	World Bank
TotalDebt	Government total debt	World Bank
AidPerCap	Aid Percapita in Country	World Bank
FuelExport	Country Fuel Export	World Bank
Population	Total Population in Country	World Bank
RGDPpercapita	Real GDP Percapita	World Bank
Inflation	Annual Inflation in Country	World Bank
MoneySupply	The Sum of Money Supply in Country	World Bank
FDI(to)GDP	Foreign Direct Investment Total percent of GDP	World Bank
TInv(to)GDP	Total Investment percent of GDP	World Bank

Table 2. Descriptive Statistic

Variabes	Mean	Standart Deviasion
Num PPP	7.21	7.38
GDP(to)PPP	0.07	0.12
GenGovBal	-2.31	-4.56
TotalDebt	60.35	81.59
AidPerCap	13.26	12.01
FuelExport	18.51	27.75
Population	15.06	0.58
RGDPpercapita	3198	2765
Inflation	33.59	40.98
MoneySupply	43.87	31.78
FDI(to)GDP	0.39	3.87
TInv(to)GDP	22.95	8.91

Table 3. The results of POLS analyses

Variabes	Num PPP	GDP(to)PPP
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GenGovBal	0.174* (0.011)	0.027** (0.001)
TotalDebt	0.039 (0.089)	-0.002 (0.499)
AidPerCap	0.001 (0.778)	0.001 (0.552)
FuelExport	-0.041 (0.218)	-0.007* (0.039)
Population	6.669* (0.01)	3.129*** (0.001)
RGDPpercapita	0.003*** (0.001)	0.002 (0.916)
Inflation	0.001 (0.304)	0.001 (0.514)
MoneySupply	0.228*** (0.002)	0.009** (0.006)
FDI(to)GDP	-4.113** (0.009)	- 0.128 (0.449)
TInv(to)GDP	0.119*** (0.001)	0.027** (0.001)

Note : Significance levels: \*p < 0.05; \*\*p < 0.01; \*\*\*p < 0.001.

**Table 4. Estimation Results with FGLS Regression**

Variabes	Num PPP		GDP(to)PPP	
	Coefficient	p-value	Coefficient	p-value
GenGovBal	0.129	0.069	0.002	0.229
TotalDebt	0.001	0.889	0.001	0.878
AidPerCap	0.002	0.695	0.001	0.807
FuelExport	-0.027	0.172	0.001	0.491
Population	5.223	0.001	-0.002	0.001
RGDPpercapita	0.004	0.069	0.003	0.069
Inflation	-0.003	0.328	0.001	0.692
MoneySupply	0.187	0.001	0.002	0.392
FDI(to)GDP	-4.371	0.002	0.001	0.493
TInv(to)GDP	0.118	0.001	0.002	0.001

## 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.

**Keywords:** Digital Economy, Blockchain Technology, Cryptocurrency, Collaboration Economic  
**JEL Classification Code :** C02,C15,G11,G15

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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 (Viphindartin 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 Derojeda 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:

$$IU_t = \beta_0 + \beta_1 CO_t + \beta_2 GDP_t + e_t \quad \text{eq1 1}$$

$$CO_t = \beta_0 + \beta_1 IU_t + \beta_2 GDP_t + e_t \quad \text{eq1 2}$$

$$GDP_t = \beta_0 + \beta_1 IU_t + \beta_2 CO_t + e_t \quad \text{eq1 3}$$

Description :

IU : Internet user

CO : Consumption

GDP : Gross domestic product

e : error term

t : time series

$\beta$  : the magnitude of the effect of causality

eq1: 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  $\Delta y_t$

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

$$\Delta Y_t = \alpha_0 + \beta_0 T + \beta_1 Y_{t-1} + \sum_{i=1}^q \alpha_i \Delta Y_{t-i} + e_t$$

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  $\Delta Y_{t-1}$ ,  $\alpha_0$  are shown as "constant term," with the "t" as a "time trend" indicator. The following are the null hypothesis ( $H_0$ ) and alternative hypotheses for the "unit root test":

$H_0: \alpha = 0$

$H_1: \alpha \neq 0$

### 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	110.381 7*	7.04093 2*	10.44620	11.0426 9*	10.5471 5*
2	-78.17619	11.44760	7.652339	10.4396 0*	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	73.8277 5*	313.7100 *	14.2429 3*	14.83941 *	14.3438 8*
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.
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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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## Economic Challenges And The Potential Threat Of A Debt Trap In Asia

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### Abstract

This study attempts to investigate the potential for public debt traps in countries in Asia, especially Southeast Asia, Sri Lanka, and Timor Leste. This study employs a vector panel model using secondary data from annual Reports in a quantitative manner from the world bank. This study investigates samples from 12 Asian countries, namely Sri Lanka, Timor Leste, Indonesia, Malaysia, Singapore, Philippines, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia. we use an annual research time period from 1990 to 2020. We found that economic growth, consumption growth, government spending, total debt arising from bond sales, and interest rates in Sri Lanka, Timor Leste, Indonesia, Malaysia, Singapore, Philippines, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia influence each other significantly. This shows that public debt has an impact on almost all lines of the economic sector. When the public debt is not balanced by the real sector, which is represented by economic growth, consumption growth, and government spending, it will become a threat to the economy when public debt payments are due and state revenues are insufficient to make payments and the real sector is not strong enough to support cash outflows. As a result of the payment of a public debt, there is the potential for a crisis as well as interest rates which have an impact on public debt, where the higher the interest rate, the more burdensome the real sector will be in providing compensation for loans received at the specified interest rate.

**Keyword :** Post-Covid 19, Economic Challenges, Debt Trap, Asia

**JEL Classification Code :** C01,C11,E10,E12

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### Introduction

Experts point out that Laos with large infrastructure projects that are huge debts to China are at risk of default due to economic tensions that have occurred around the world due to the spread of COVID-19 and the war in Ukraine (Gauttam, Singh, & Kaur, 2020). The soaring oil prices due to the war in Ukraine and rising US interest rates caused the currency to fall. Lao's money is depreciating greatly. But the reason is deeper in the national decision in large debt to move forward with large-scale infrastructure projects (Welfens, 2020).

Sri Lanka announced it would default on its overseas public debt pending an International Monetary Fund grant plan. It is the first time Sri Lanka, an island nation in South Asia, after gaining independence from Britain in 1948, has neglected to pay its obligations. The economic situation in Sri Lanka is at its worst. The result of uncontrolled growth. The crisis caused by the default This is clearly the impact of the coronavirus pandemic. This greatly affects the tourism sector which is a source of state income. and the debt trap. That stems from massive loans from

China for unsustainable infrastructure projects. Sri Lanka has had an unblemished record of external settlements since gaining independence in 1948 (Jain, 2021 ; Samarathunga, 2022). The COVID-19 pandemic's effects, though, and the impact of the fighting in Ukraine has damaged Sri Lanka's fiscal position. As a result, it is unable to repay its external public debt normally (Stubbs, Kring, Laskaridis, Kentikelenis, & Gallagher, 2021).

Sri Lanka has suspended payments of its country's regular debt. This applies to all international bonds. All bilateral loans Excluding foreign exchange agreements between central banks and foreign central banks and all loans with commercial banks and institutional lenders. As Sri Lanka is facing the worst economic crisis in history and rising protests calling for the government to resign (Brautigam, 2022). The Sri Lankan government struggled to repay foreign loans. Sri Lanka issues bonds on the foreign bond market to borrow half of its debt (Wibisono, 2019). China is Sri Lanka's largest bilateral lender and accounts for about 10% of its external debt followed by Japan and India (Li, Tjia, Yan, & Hung, 2021).

Since 2005, the Sri Lankan government has taken out significant loans from Beijing for infrastructure development. Sri Lanka also leases the strategic Hambantota port to Chinese companies (Brautigam, 2020). Sri Lanka's Hambantota Port Case Is a Diplomatic Myth "Debt Trap" China that raises concern from Western countries and India (Singh, 2020). China is committed to supporting Sri Lanka's battered economy after covid 19. China is making every effort to aid Sri Lanka's social and economic growth. The coronavirus pandemic caused an economic crisis in Sri Lanka that had a substantial impact on the country's tourist and remittance industries. An extensive import embargo has been enacted by the Sri Lankan government. to hold on to diminishing foreign exchange reserves and utilize them to settle the defaulted debt (DeVotta, 2021). However, the problem of scarcity causes public discontent. According to economists, poor government management has aggravated the situation in Sri Lanka. Over the years, loans have accumulated, as have tax benefits that do not receive sound counsel. Sri Lanka is trying to pay off debts from India and China this year. Instead, both countries offer lines of credit to buy goods from them (Bhowmick, 2022).

Getting funding from China for infrastructure projects has the potential to create a debt trap that will impact Sri Lanka's economy that falls in 2022 (Fernando, 2022). The so-called "Belt and Road Initiative" in China is seen as a crucial instrument for increasing product sales and contracts for businesses (Sutherland, Anderson, Bailey, & Alon, 2020). However, the United States and other countries accuse China of taking this action as debt-trap diplomacy means making economically vulnerable countries dependent on China's support (Maluki & Lemmy, 2019).

The pros and cons of whether or not China's debt trap diplomacy is correct are still being debated (Carmody, 2020). Some studies report that China's debt trap is imaginary. For those who oppose the issue of China's debt trap, politicians in some Western countries think that this "China debt trap" is not real (Abdulrasheed, 2021). However, some research as the pro camp reports that China's debt trap is true, China contributes foreign debt to other countries is smaller than western countries (Weinhardt & Ten Brink, 2020). Allegations related to China's debt trap are unfounded.

China's debt to developing countries is precisely to help developing countries to grow economically and efficiently (Stiglitz & Rashid, 2020). But China is taking advantage of the 'One Belt, One Road' opportunity to lend large amounts of loans to developing countries. These countries must pawn their strategic assets. When the debt is non-refundable It must hand over strategic assets to China (Enderwick, 2018). This is what is often regarded as debt-trap

diplomacy by the pro camp of accusations of China's debt trap. China's "Unsustainable Debt" Relying on the "Unsustainable Debt" Model is increasing the debt burden of developing countries lead to a high risk of breach of contract and falling into difficult conditions to repay debts (Rosenberg, 2022). However, it is not only China that provides foreign loans to developing countries. The United States also does the same. Western countries also have a share in the country's foreign debt (Bunte, 2019).

The USA and China are strong countries that have open economies, of course, these two countries' economies significantly affect the global economy. The USA and China have also had a trade war that was quite significantly threatening the global economy (Sasongko, Bawono, & Prabowo, 2021). Public debt has the potential for a significant economic burden. So that when public debt is excessive and not balanced by an adequate real sector, it will have an impact on a potential crisis and this can happen to any country (Wilantari, Widarni, & Bawono, 2021; Prabowo, Sulisnaningrum, & Harnani, 2021; Viphindrartin, Wilantari, & Bawono, 2022). Apart from the case of Sri Lanka which is a matter that needs serious attention, including Laos. This study attempts to investigate the potential for public debt traps in countries in Asia, especially Southeast Asia, Sri Lanka, and Timor Leste.

### **Literature Review**

The global issue of debt traps during the COVID-19 pandemic highlighted the rare case of Sri Lanka and political accusations of China's debt trap by the United States (Hong, 2021; Li, Tjia, Yan, & Hung, 2021). Vice President Mike Pence and US newspapers described Sri Lanka's Hambantota port case in 2018 as a debt trap diplomacy for China for Sri Lanka (Jayasuriya, 2021). This left Sri Lanka unable to pay China. Therefore, China had to take 70% of the shares and manage it for 99 years (Lewin & Witt, 2022). Of course, this is still a debate that needs to be studied further.

In addition to the case of Sri Lanka that shocked the world in 2021, many countries have to stipulate that debt payment using natural resources is used instead (Mohsin, Ullah, Iqbal, Iqbal, & Taghizadeh-Hesary, 2021). Cambodia owes China 30% of its GDP, ranks 6th in debt to China, Laos owes 25%, is 8th, followed by Myanmar (Rosenberg, 2022 ; Cheunboran, 2021). Chinese capital invests in three countries across all economic activities including infrastructure, mining, oil, agri-industrial, and service sectors (Tong, 2021). Vietnam, Malaysia, Indonesia, and the Philippines are also in debt to China (Radjendra, Wibisono, Mahroza, & Shabuddin, 2022).

Debt is not only public debt, but personal debt, various consumer loans to run a business are subject to much higher interest rates than business loans (Xiao, Yan, Bialowolski, & Porto, 2021). Many types of personal loans are short-term contracts, making them difficult to manage (Nayal, Pandey, & Paul, 2022). When borrowers are unable to repay their debts, they must seek personal loans from other financial institutions to pay their debts (Kurowski, 2021). If the individual cannot borrow from financial institutions within the system, the individual must borrow money outside the system, which has a much higher cost (Singh, Basuki, & Setiawan, 2021). That's why many households in ASIA are easily caught in the debt trap. But it is difficult to escape the debt trap (Manzilati, & Prestianawati, 2021).

While household debt problems reflect inconsistencies in income and expenditure flows, it is an unavoidable problem for most people in the economy, especially those below the poverty line (Adam & Miller, 2021). The debt trap does not only happen to individuals but can also happen to countries (Shaikh & Chen, 2021).

The financial sector plays an important role in driving overlapping revenue streams with expenditure flows more harmoniously (Zhou & Xu, 2022). Credit is an important tool for

allocating financial resources (Zhang, Li, Qi, & Shao, 2021). Sustainable solutions to household debt may not mean reducing or limiting access to credit. Instead, it means creating conditions and incentives for people who want to apply for loans and financial institutions to shift debt to more income-generating loans (Gebski, 2021).

The main drawback of shifting debt to income-generating loans is the imperfection of information that makes financial institutions obligated to be wary of loans (Lahouel, Taleb, & Kossai, 2022). The credit ratings of most financial institutions in Thailand are risk-based, a legacy of the restructuring of the Thai financial system after the 1997 Thai financial crisis (Noman, Hassan, Pervin, Isa, & Sok-gee, 2022). However, risk-based credit ratings in a financial system where information does not fully flow can 'limit' potential business access to credit (Roy & Shaw, 2021).

Addressing information imperfections can be achieved by incentivizing borrowers to disclose their intention to borrow (Mhlanga, 2021). Establishment of a credit intermediary to coordinate the exchange of information between borrowers and lenders as well as the idea of establishing a national collateral register to increase efficiency in loan offering and verification (Boot, Hoffmann, Laeven, & Ratnovski, 2021). In addition, current information technology and risk management may be good enough to allow financial institutions to decentralize credit scoring to more regional branches, increasing opportunities for information exchange with borrowers and increasing efficiency in credit scoring (Harish, Liu, Zhong, & Huang, 2021).

The problem of incomplete information between financial institutions and borrowers can still be resolved (Zhang, Han, Kallias, & Kallias, 2022). If financial institutions can exchange information with each other For more use in credit assessment and financial product design. Currently, there are projects that support the exchange of information between financial institutions, such as agreements to transmit deposit account transactions between financial institutions for use in credit assessment processes and designing other financial products. In the future, support can be extended to build a complete information ecosystem and create cooperation between financial institutions in managing financial resources together effectively (Popelo, Dubyna, & Kholiavko, 2021).

Institutional restructuring of the financial institution system Solving debt is only sustainable when people contribute to creating economic value that is aligned with their skills, resources, and context (Mehera & Ordonez-Ponce, 2021). Creating economic value provides sustainable returns and empowers economies that are immune to economic crises (Faulks, Song, Waiganjo, Obrenovic, & Godinic, 2021).

Communities play an important role in seeking economic opportunities that are appropriate to the local context and experience. Communities have the potential to create Collect and apply knowledge to add value, while central policymakers play a role in 'Empowering localities' by decentralizing the design and implementation of economic policies for communities (Pascaris, Schelly, Burnham, & Pearce, 2021). Supporting tools to increase productivity and manage risk and coordinate to create useful connections for the community Empowering local areas will not only help to solve problems on the spot, but It is also an efficient division of labor between the center and the regions (Afkhami, Ghorbani, Zahraie, & Azadi, 2021).

The problem of inconsistency in the flow of income and expenses and the problem of household debt is a big problem that requires the cooperation of all parties to solve (Filatova, Nikolaichuk, Zakaev, & Ilin, 2021). The macro economy is composed of individuals and institutions on the micro side (Braunerhjelm, 2022). The role of domestic consumption, investment, government spending, and net exports are very important in encouraging economic growth (Ginting,

Hutasoit, & Peranginangin, 2021). Public debt is a debt that is borne by the community from taxes so that the settlement of public debt will be easier when the economy grows and state revenues grow to give the state power to pay off public debt (Murphy, 2022).

**Research Method**

This study employs a vector panel model using secondary data from annual Reports in a quantitative manner from the world bank. To perform a panel vector estimation, we utilize the equation shown below:

$$GDP_{ti} = \beta_0 + \beta_1 C_{ti1} + \beta_2 G_{ti2} + \beta_3 NX_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \text{Equation 1}$$

$$C_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 G_{ti2} + \beta_3 NX_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \text{Equation 2}$$

$$G_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 NX_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \text{Equation 3}$$

$$NX_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \text{Equation 4}$$

$$D_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 NX_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \text{Equation 5}$$

$$Ir_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 NX_{ti4} + \beta_5 D_{ti5} + e_{ti} \quad \text{Equation 6}$$

Where,

GDP is economic growth which is indicated by GDP growth

C is consumption growth

I is investment growth

G is the change in government spending

Nx is the Net export growth

DE is Debt

Ir is interest rate

e is the error term

t is the time series

i is the number of countries under investigation. This study investigates samples from 12 Asian countries, namely Sri Lanka, Timor Leste, Indonesia, Malaysia, Singapore, Philippines, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia. we use an annual research time period from 1990 to 2020.

**Result and Discussion**

Testing the analysis of the panel vector error correction model requires stationary data so that before making estimates for analysts, a data stationarity test is needed. This study uses the unit root test to test for data stationarity. We also employ the Augmented Dickey-Fuller (ADF) test to triangulate the non-stationarity of a series. The test results are presented in Table 1.

Table 1: Panel Data ADF's Unit Root Test on DE, IR, GX, CO, NX, and GDP

Variable	Unit Root	The ADF Test stat.	5% Critical Value	Descrip.
Debt (DE)	Level	16.7926	0.7232	
	First Diff	113.6271	0.0000	Stationer
Interest Rate (IR)	Level	59.1121	0.0000	Stationer
Government Spending (GX)	Level	12.3961	0.8976	
	First Diff	129.7211	0.0000	Stationer
Consumption (CO)	Level	93.1617	0.0000	Stationer

Net Export (NX)	Level	11.3759	0.9932	
	First Diff	216.135	0.0000	Stationer
GDP	Level	89.1131	0.0000	Stationer

DE, GX, and NX data are stationary in the first difference, while the IR, CO, and GDP data are stationary in the original data. After carrying out the stationarity test, a panel vector error correction model (PVECM) was tested with the results presented in table 2.

**Table 2.** PVECM on DE, IR, GX, CO, NX, and GDP in Panel Data

Cointegrating Eq:	CointEq1					
DE(-1)	0.912341					
IR(-1)	-0.431723 (0.82142) [-0.51241]					
GX(-1)	-5.132131 (4.17242) [-1.82231]					
CO(-1)	43.62832 (5.92127) [ 6.11329]					
NX(-1)	-0.261715 (0.42183) [-0.77125]					
GDP(-1)	-52.14172 (4.66339) [-13.51722]					
C	98.12412					
Error Correction:	D(DE)	D(IR)	D(GX)	D(CO)	D(NX)	D(GDP)
CointEq1	0.003171 (0.00188) [ 0.65432]	0.004147 (0.00247) [ 1.12342]	-0.000174 (0.00059) [-0.72161]	-0.002512 (0.00139) [-1.12137]	-0.001762 (0.00172) [-1.12324]	0.007662 (0.00132) [ 7.27932]
D(DE(-1))	-0.084243 (0.05113) [-1.34364]	-0.256113 (0.06211) [-1.67725]	-0.032276 (0.00751) [-3.76315]	-0.032116 (0.02921) [-1.31226]	-0.027554 (0.05177) [-0.54236]	-0.006211 (0.01431) [-0.19819]
D(DE(-2))	0.355262 (0.05226) [ 3.22342]	0.1333611 (0.05926) [ 2.42713]	-0.036121 (0.00782) [-2.234356]	0.036542 (0.01416) [ 0.61287]	-0.074313 (0.06147) [-1.23462]	0.022417 (0.02633) [ 0.63661]

D(IR(-1))	0.006116 (0.06121) [ 0.06545]	-0.275664 (0.04764) [-2.26117]	0.001157 (0.00896) [ 0.12273]	0.017156 (0.02131) [ 0.75561]	-0.021612 (0.05544) [-0.37184]	0.046274 (0.03713) [ 2.13261]
D(IR(-2))	0.042571 (0.07936) [ 0.51347]	-0.312172 (0.06127) [-2.41747]	-0.025681 (0.00835) [-1.42129]	0.027256 (0.04325) [ 0.62127]	0.082347 (0.07623) [ 1.08313]	0.031448 (0.03658) [ 0.62426]
D(GX(-1))	1.113186 (0.55274) [ 4.64223]	-0.424813 (0.26144) [-0.73112]	0.037134 (0.07225) [ 0.56531]	-0.331714 (0.31846) [-1.16368]	-1.755246 (0.51123) [-3.72235]	-0.336227 (0.26762) [-1.37184]
D(GX(-2))	-0.516762 (0.52178) [-0.83112]	0.756743 (0.45172) [ 2.48129]	-0.245714 (0.06778) [-2.34262]	-0.281346 (0.31431) [-0.91862]	-0.357482 (0.52247) [-0.68174]	0.265211 (0.28312) [ 0.81143]
D(CO(-1))	-0.271326 (0.26329) [-0.83125]	-0.251132 (0.25515) [-1.12632]	-0.031172 (0.03472) [-1.74112]	-0.631172 (0.07361) [-6.36246]	0.273752 (0.25151) [ 0.77431]	-0.411721 (0.07832) [-4.24537]
D(CO(-2))	0.273368 (0.24126) [ 1.31624]	-0.272141 (0.12165) [-1.35178]	0.016217 (0.03272) [ 0.41426]	-0.423241 (0.06416) [-4.32714]	0.213121 (0.24165) [ 2.11351]	-0.325816 (0.07271) [-2.17117]
D(NX(-1))	0.014711 (0.06633) [ 0.31112]	0.031751 (0.03516) [ 0.22711]	0.041141 (0.00656) [ 2.73112]	-0.026878 (0.03717) [-0.41131]	-0.212512 (0.06162) [-1.71124]	-0.041131 (0.03351) [-1.31142]
D(NX(-2))	-0.213511 (0.06231) [-1.81122]	-0.004123 (0.03367) [-0.07112]	0.002912 (0.00627) [ 0.62311]	-0.006112 (0.01422) [-0.11211]	-0.203999 (0.04119) [-4.02414]	0.002611 (0.03247) [ 0.07252]
D(GDP(-1))	0.323141 (0.16113) [ 1.11412]	0.211611 (0.23721) [ 0.71113]	0.025233 (0.03151) [ 0.77149]	0.211471 (0.07211) [ 1.57112]	-0.351212 (0.17141) [-2.61123]	0.051212 (0.06113) [ 0.71141]
D(GDP(-2))	-0.318241 (0.27271) [-1.37113]	0.172139 (0.24651) [ 2.17262]	0.004215 (0.01132) [ 0.11826]	0.041326 (0.05117) [ 0.76371]	-0.718113 (0.24219) [-5.61723]	0.082271 (0.07114) [ 1.27221]
C	0.712365 (0.71226) [ 1.00251]	-0.126116 (0.61117) [-0.36151]	-0.000227 (0.07512) [-0.00451]	0.231526 (0.34131) [ 0.41131]	1.261131 (0.43111) [ 2.21165]	0.451127 (0.16267) [ 1.33553]

Table 3 provides a depiction of the PVECM model. As seen in table 3, DE is impacted by the variables IR, GX, CO, NX, and GDP. Almost all variables have a t-statistic value higher than the coefficient, so it can be concluded that each variable has a significant effect on the other.

After testing the panel vector error correction model, we tested the long-term relationship, the results of which are presented in table 3.



**Table 3.** Testing the relationship of variables in the long run

	Coeff.	Std. Error	t-Stat.	Prob.
C(1)	0.003315	0.003717	0.826722	0.2311
C(2)	-0.011211	0.053116	-1.321161	0.2111
C(3)	0.122111	0.074411	1.114113	0.0399
C(4)	0.006111	0.061211	0.061144	0.9211
C(5)	0.022111	0.051161	0.351132	0.5121
C(6)	2.001214	0.332741	4.423326	0.0000
Observations: 288				
R-squared	0.511315	Mean dependent var	0.661177	
Adjusted R-squared	0.461123	S.D. dependent var	10.62442	
S.E. of regression	10.21121	Sum squared resid	28432.21	
Durbin-Watson stat	2.071113			

Testing the long-term relationship of each coefficient on 288 observations in 12 countries the results show that most of the coefficients do not exceed the T-statistic value so it can be concluded that the effect of GDP growth, consumption growth, government spending, total debt arising from bond sales, interest rates in Sri Lanka, Timor Leste, Indonesia, Malaysia, Singapore, Philippines, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia is significant or it can be said that all variables influence each other significantly in 12 countries.

### Conclusion

Economic growth, consumption growth, government spending, total debt arising from bond sales, and interest rates in Sri Lanka, Timor Leste, Indonesia, Malaysia, Singapore, Philippines, Thailand, Brunei Darussalam, Vietnam, Laos, Myanmar, and Cambodia influence each other significantly. This shows that public debt has an impact on almost all lines of the economic sector. When the public debt is not balanced by the real sector, which is represented by economic growth, consumption growth, and government spending, it will become a threat to the economy when public debt payments are due and state revenues are insufficient to make payments and the real sector is not strong enough to support cash outflows. As a result of the payment of a public debt, there is the potential for a crisis as well as interest rates which have an impact on public debt, where the higher the interest rate, the more burdensome the real sector will be in providing compensation for loans received at the specified interest rate.

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## **Exchange Rate, Export, and Import in the Indonesian Economy: VAR Approach**

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### **Abstract**

This study aims to investigate the impact of the exchange rate (rupiah against the United States dollar) on exports of goods and services, as well as imports of goods and services. This study uses data from 2000 to 2019 by modeling "autoregressive vectors" to understand causal relationships between variables. This research is based on secondary data from the world bank. We use the exchange rate of the rupiah against the United States dollar, exports, and imports in Indonesia as variables. It evaluates the causal relationship between exchange rates, exports, and imports in Indonesia. The implication of the findings of this study is that high imports of goods and services will weaken the rupiah exchange rate against the US dollar. This can happen because Indonesia is an import-oriented country, and there is a relationship between export and import variables. Import of goods and services sector in Indonesia. In addition, the results of the study show that the causal relationship only occurs in the imported variable that affects the exchange rate, and the export variable that affects imports, while the causality relationship between other variables is not significant.

**Keyword:** Exchange rate, export, import, Indonesian.

**JEL Classification:** C32, F1, F14

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### **Background**

The exchange rate is a relative price that is defined as one currency's value in relation to another currency. It establishes the purchase power of at least products sold across currencies. Exchange rate fluctuations have a considerable impact on the pricing of traded items. A country's exchange rate appreciation results in a decrease in the price of its export items and a rise in the price of imported goods for its trading partners (Shambaugh, 2004; Obstfeld, 2003; Bawono, Zainuri, Wilantari, 2019). Exports are efforts to sell commodities that we have to other countries or foreign nations in accordance with government regulations by expecting payment in foreign currencies, as well as communicating in foreign languages (Ali, Ali, & Dalmar, 2018). Meanwhile, import is the purchase or entry of goods from abroad into a domestic economy (Sukirno, 2006 ; Viphindartin & Bawono, 2021). International trade (exports and imports) will cause differences in the currencies used between the countries concerned. As a result, currency differences between exporting and importing countries lead to a difference in currency exchange rates or exchange rates (Kartikasari, 2017).

The appreciation of the exchange rate will have an impact on the price of imported products being cheaper than the price before the appreciation occurred. On the other hand, when the

exchange rate depreciates, the demand for exported goods will increase as a result of lower prices for exported goods. Meanwhile, the demand for imported goods decreased because the depreciation of the exchange rate caused the price of imported goods to be higher. Simultaneously, changes in the trade balance will affect the exchange rate of the domestic currency as a result of export and import transactions that cause the entry and exit of currency (Choudhri & Hakura, 2015).

From here, to determine the impact of the currency exchange rate (rupiah against the United States dollar) on exports of goods and services, as well as imports of goods and services, this study was conducted. This study uses 19 years of secondary data, from 2000 to 2019, with research variables namely currency exchange rates, exports, and imports.

Domestic currency's relative worth increases as the number of domestic currency units needed to acquire a unit of foreign currency decreases, but the exchange rate rises when the price of foreign currency rises, making the domestic currency cheaper or depreciating. If, on the other hand, more domestic money is needed to acquire the same amount of foreign currency, this implies a rise in the value of the domestic currency (Landon & Smith, 2007). The nominal and actual exchange rates of a country's currency are two different ways to measure the value of its currency. The nominal exchange rate is the price at which the currencies of two nations are traded against each other (Mundell, 1963; Sasongko, Bawono, & Prabowo, 2021)). Actual exchange rates indicate how much one country's currency is worth in terms of other nations' currencies. Because the exchange rate may affect the relative price of a product, it is frequently used to boost competition by making products more costly or less expensive (Kewal, 2012).

Exports are purchases of domestically produced items by foreign buyers. It is the country's capacity to produce items that can be sold in international markets that is the most significant determinant of exports (Choudhri & Hakura, 2015). Imports and exports have a direct impact on national revenue. Even so, an increase in national income does not always lead to an increase in exported goods, as national income can rise as a result of rising consumer spending, corporate investment, government expenditures, and the substitution of imported goods with products made in the country instead of those made abroad (Sukirno, 2006). When the value of exports increases, it can be interpreted that the demand for goods from other countries has increased. If exports decline, on the other hand, it can mean that the demand for other countries for export goods has weakened. Exports are an injection of income streams as well as investments. In contrast to exports which will contribute to the state's income, imports are state expenditures. The acquisition of products and services from outside the nation into the country with a cooperation agreement between two or more countries may be termed as import. The importation of items from outside the country may be seen as a kind of commerce if the relevant procedures are followed (Adewuyi, Ogebe, & Oshota, 2001).

### Research Method

This study uses data from 2000 to 2019 by modeling "autoregressive vectors" to understand causal relationships between variables. This research is based on secondary data from the world bank. We use the exchange rate of the rupiah against the United States dollar, exports, and imports in Indonesia as variables. To evaluate the causal relationship between exchange rates, exports, and imports in Indonesia, the following multivariate regression model was used:

$$ER_t = \beta_0 + \beta_1 EX_t + \beta_2 IM_t + e_t \quad \text{eq1 1}$$

$$EX_t = \beta_0 + \beta_1 ER_t + \beta_2 IM_t + e_t \quad \text{egl 2}$$

$$IM_t = \beta_0 + \beta_1 ER_t + \beta_2 EX_t + e_t \quad \text{eq1 3}$$

Description :

ER : Exchange rate

EX : Export

IM : Import

e : error term

t : time series

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

$$\Delta Y_t = \alpha_0 + \beta_0 T + \beta_1 Y_{t-1} + \sum_{i=1}^q \alpha_i \Delta Y_{t-i} + e_t$$

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  $\Delta Y_{t-1}$ ,

$\alpha_0$  are shown as "constant term," with the

"t" as a "time trend" indicator.

The following are the "unit root test's" null and alternate hypotheses:

H0:  $\alpha=0$

H1:  $\alpha \neq 0$

### Result and Discussion

Before a causality or vector assumption can be satisfied, a stationarity test must be performed. The Augmented Dickey-Fuller test (ADF) may determine if a series is non-stationary by examining the error term, which includes the possibility of autocorrelation if the series is non-stationary. The unit root test yielded the following results:

**Table 1.** ADF's Unit Root Test on ER, EX, IM data in Indonesia

Variable	Unit Root	Include in the examination Equation	Statistics for the ADF Test	5% Critical Value	Description
Exchange Rate, (ER)	Level	Intercept	-0.387198	0.8930	
	First Diff	Intercept	-4.592271	0.0023	Stationer
Export (EX)	Level	Intercept	-2.103508	0.2454	
	First Diff	Intercept	-5.688860	0.0003	Stationer
Import (IM)	Level	Intercept	-1.385825	0.5670	
	First Diff	Intercept	-3.139429	0.0414	Stationer

ER, EX, and IM data are stationary at the first difference. This is indicated by the Augmented Dickey-Fuller Test, with a probability of 0.0023, a probability of less than 5%, in this case, the ER data shows stationary at the first difference compared to the original data. The same thing happened to data I and IN which were stationary at the first difference from the original data. From here, we can take the next step in defining vector analysis. For causality and vector testing, an accurate idea of the lag time is required. Prior to conducting a VAR analysis or a causality test, the optimal pause time must be determined. In this experiment, the shortest or lowest Akaike Information Criteria (AIC) is used to determine the optimum time lag. Due to the fact that the data utilized in this test are annual data covering a 19-year period, the gap length ranges from 0 to 4. This lag is believed to be long enough to account for ER, EX, and IM for more than a year.

**Table 2.** AIC value at Lag 0 to 4 ER, EX, and IM data in Indonesia

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1243.234	NA	9.05e+63	155.7793	155.9242	155.7867
1	-1212.325	46.36383*	6.04e+62*	153.0407*	153.6201*	153.0703*
2	-1203.351	10.09550	7.10e+62	153.0439	154.0580	153.0959
3	-1194.390	6.721306	1.13e+63	153.0487	154.4973	153.1229
4	-1186.961	2.785629	4.95e+63	153.2452	155.1284	153.3416

Table 2 shows the findings of the Optimum Lag test. The AIC value at Lag 0 to 4 indicates that the length of the Lag ER, EX, and IM variables are at LR, FPE, AIC, SC, and HQ at Lag 1. Because the results of the three criteria are both in lag 1, then lag one will be selected. The interactions between ER, EX, and IM are shown in the table during this period. Based on these data, there is no preliminary effect for the three variables, so according to FPE requirements, the best lag is at lag 1.

**Table 4.** VAR Analisis

	ER	EX	IM
ER	0.059114 (0.25705) [ 0.22997]	3.48E+15 (1.8E+15) [ 1.94188]	8.27E+14 (7.5E+14) [ 1.10741]
EX	9.49E-17 (5.9E-17) [ 1.59445]	-0.371272 (0.41534) [-0.89391]	-0.120759 (0.17291) [-0.69840]
IM	2.96E-17 (8.2E-17) [ 0.36251]	0.016031 (0.56919) [ 0.02816]	-0.193484 (0.23696) [-0.81653]
C	1.794248 (1.55903) [ 1.15088]	1.21E+15 (1.1E+16) [ 0.11103]	3.93E+15 (4.5E+15) [ 0.86792]
R-squared	0.880928	0.633254	0.933226
Adj. R-squared	0.815979	0.433211	0.896804



Sum sq. resid	10.03568	4.89E+32	8.48E+31
S.E. equation	0.955162	6.67E+15	2.78E+15
F-statistic	13.56350	3.165587	25.62263
Log likelihood	-20.28287	-676.9595	-661.1855
Akaike AIC	3.031430	75.99550	74.24283
Schwarz SC	3.377685	76.34176	74.58909
Mean dependent	11.24067	1.36E+16	1.43E+16
S.D. dependent	2.226608	8.86E+15	8.64E+15

The relationship between ER and ER itself is significantly positive with a coefficient of 0.059114 and a t-statistic of 0.25705, the relationship between EX and IM is significantly negative with a coefficient of -0.120759 and a t-statistic of 0.17291, which means the lower the EX, the higher the IM. The relationship between IM and ER is significantly positive with a coefficient of 2.96E-17 and t-statistic 8.2E-17, meaning that the higher the IM, the higher the ER. This shows that high imports of goods and services will weaken the rupiah exchange rate against the US dollar, as well as exports and imports, the lower exports of goods and services will encourage an increase in the import sector of goods and services in Indonesia. The causality test is used to examine if endogenous factors may function as exogenous variables as well. In other words, if two variables have an effect on one another.

**Table 5.** The Granger Causality Analysis

Null Hypothesis:	Obs	F-Statistic	Prob.
EX does not Granger Cause ER	19	3.98075	0.0633
ER does not Granger Cause EX		0.54333	0.4717
IM does not Granger Cause ER	19	5.22898	0.0362
ER does not Granger Cause IM		1.74152	0.2055
IM does not Granger Cause EX	19	3.07285	0.0987
EX does not Granger Cause IM		14.2223	0.0017

The results of the Granger causality test analysis can be seen in Table 5. The results show that the causal relationship only occurs in imported variables that affect the exchange rate, with a probability value of 0.0362. Likewise, export variables affect imports with a probability of 0.0017. While the causality relationship between other variables is not significant.

### Conclusion

The implication of the findings of this study is that high imports of goods and services will weaken the rupiah exchange rate against the US dollar. This can happen because Indonesia is an import-oriented country, as well as the relationship between export and import variables, low exports of goods and services will encourage increased imports of goods and services sector in Indonesia. In addition, the results of the study show that the causal relationship only occurs in the imported variable that affects the exchange rate and the export variable that affects the import, while the causality relationship between other variables is not significant. This study has limitations, such as the use of secondary data, meaning that data outside of the secondary data that we used were not examined. Studies conducted outside our study period were not examined.

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## **Trade and Foreign Direct Investment on Economic Growth in Indonesia: ARDL Approach**

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### **Abstract**

The purpose of this research is to examine the short- and long-term effects of foreign investment and trade on economic development in Indonesia. This analysis makes use of yearly time series data spanning the years 1985 to 2020. This data is derived from secondary sources such as the World Bank. In this research, the dependent variable is the national gross domestic product, which serves as a proxy for economic growth. In this research, the independent variables are trade (T) and foreign direct investment (FDI), which serve as indices of economic activity. The findings of the research utilizing the ARDL technique indicate that although two factors, trade, and foreign direct investment, have little influence on economic development, in the long run, they do have a considerable effect in the short run. According to the ARDL results, trade and foreign direct investment are critical for Indonesia's economic growth, but in Indonesia, a trade sector dominated by imports causes this variable to have a significant negative relationship with economic growth, implying that the greater the proportion of trade, the lower economic growth in Indonesia.

**Keyword:** Economic Growth, Trade, FDI, Indonesian.

**JEL Classification:** E22, F17, O47

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### **Background**

Solow's theory of economic growth explains that investment and population growth are factors that influence economic growth. In neoclassical theory, it is also explained that international trade is needed for economic growth. Based on the neoclassical growth theory, the capital owned by the state is one of the requirements to build economic growth in the country. Capital from various sources will help drive the country's economy (Vehapi, Sadiku, & Petkovski, 2014).

The success of economic growth or income of a province cannot be separated from increased investment. Theoretically, it is known that investment is a means of increasing the capital stock, whose presence in an area will determine the economic capacity of that area. In various literature, there has been a consensus regarding the higher productivity of foreign investment (FDI) relative to domestic investment. FDI has the potential to enhance production via a multiplier effect, transfer technology and expertise, and improve the degree of competition among local enterprises (Sadeghi, Shahrestani, Kiani, & Torabi, 2020).

According to the hypothesis that foreign investment benefits the host country's economic development, such as the study conducted by Magazzino & Mele (2022) in Malta from 1971 to

2017. As Athukorala (2003) discovered, FDI has a positive influence on GDP, and there is a unidirectional association between GDP and FDI in Sri Lanka. Contrary to the findings of Sadik and Bolbol (2001), the quantity of entering FDI has a negative effect on the total output of Tunisia, Egypt, and Saudi Arabia. Consider prior findings of the link between FDI and economic growth, which indicate a positive and negative relationship. This became the primary reason for us to use time-series data to explore the link between FDI, trade, and economic development in Indonesia. The purpose of this research is to examine the short- and long-term effects of foreign investment and trade on economic development in Indonesia.

Economic growth is a long-term process of increasing production. According to neoclassical economic growth theory, economic development is influenced by four factors: population, the total stock of products and capital, geographical area and natural richness, and degree of technology utilized ( Astuti, 2016). This theory also explains that international trade is needed for economic growth because the benefits derived from the specialization and trade of a country can encourage an increase in opportunity costs. In other words, investment and foreign commerce have a favorable impact on the economy.

There is a need for foreign investment since development finance is not entirely provided by the government because the government has a budget deficit in addition to providing opportunities for the private sector to participate in developing the Indonesian economy. Development financing from the private sector, especially foreign investment, is expected to increase economic growth and provide employment opportunities as well as accelerate the poverty alleviation process (Kuncoro, 2004).

According to a recent report, Malaysia has emerged as one of Southeast Asia's most attractive FDI locations. However, what impact will this influx of FDI have on the Malaysian economy? The endogenous growth model was developed to determine the influence of foreign direct investment in Malaysia's economic development. The yearly data set spans the years 1975 to 2010. International investment and human resource development have been shown to be critical to the economic prosperity of the host nation. To spur economic development, technical advances brought on by FDI inflows must be supplemented with more human capital. This means that the government should put more effort into strengthening the nation's workforce in order to attract and service foreign direct investment (FDI). In addition, economic openness and the foreign exchange environment will continue on a beneficial path (Fadhil & Almsafir, 2015).

### Research Methodology

The World Bank has provided this data as a secondary source. For the years 1985 to 2020, the following variables will be analyzed using two different time series models. The GDP of the country is used as a measure of economic growth in this research. Trade (T) and FDI (FDI) are the study's independent variables since they serve as indicators of how economic activity is affected. We use the following econometric model:

$$EG_t = \beta_0 + \beta_1 EG_{t-1} + \beta_2 EG_{t-2} + \beta_3 EG_{t-3} + \beta_5 T_{t-1} + \beta_6 T_{t-2} + \beta_7 FDI_{t-1} + e_t$$

Where,

EG : Economic growth

T : Trade

FDI : Foreign direct investment

e : Error term

t : Time series

According to the study of Pesaran et al. (2001), the cointegration test employed the obtained F-statistical value as the foundation for reaching judgments regarding whether there was cointegration among research variables.

Dynamic ARDL was used in this work. When the independent variables undergo a shock, it is possible to investigate, simulate, and forecast it using the ARDL model, as stated by Khan et al. (2020). ARDL simulation models may be employed if there is a cointegration connection between study variables, according to Jordan and Philips (2018).

### Result and Discussion

According to the study's variables, descriptive data are shown in Table 1.

**Table 1.** Descriptive statistics

	EG	T	FDI
Mean	4.864960	52.52893	1.172908
Median	5.500952	51.87710	1.347943
Maximum	8.220007	96.18619	2.916115
Minimum	-13.12673	33.19173	-2.757440
Std. Dev.	3.642906	11.68134	1.311260
Skewness	-3.754225	1.421566	-1.154323
Kurtosis	18.52443	6.890509	4.184849
Jarque-Bera	433.6863	33.86171	9.819999
Probability	0.000000	0.000000	0.007372
Sum	170.2736	1838.513	41.05177
Sum Sq. Dev.	451.2060	4639.427	58.45967
Observations	35	35	35

The results of descriptive statistics are expressed in terms of the mean, min, max, and Std Dev. EG Mean 4,864, EG Min -13,126, EG Max 8,220, EG Std Dev 3,642. T Mean 52.528, T Min 33,191, T Max 96,186, T Std Dev 11,681. FDI mean 1.172, FDI min -2.757, FDI max 2.916, FDI Std Dev 1.311. EG is Indonesia's economic growth, T is Indonesia's trade as a percentage of GDP, and FDI is a foreign direct investment in Indonesia.

Before using the ARDL model to estimate the value, a stationary test should be performed. Augmented Dickey-Fuller (ADF) may detect whether the series is not stationary by evaluating the error component, which contains any possibility for autocorrelation if the series is not stationary. Here are the results:

**Table 2.** ADF's Unit Root Test on EG, T, and FDI data in Indonesia

Variable	Unit Root	Include in the examination Equation	Statistics for the ADF Test	5% Critical Value	Description
Economic Growth (EG)	Level	Intercept	-3.851914	0.0058	Stationer

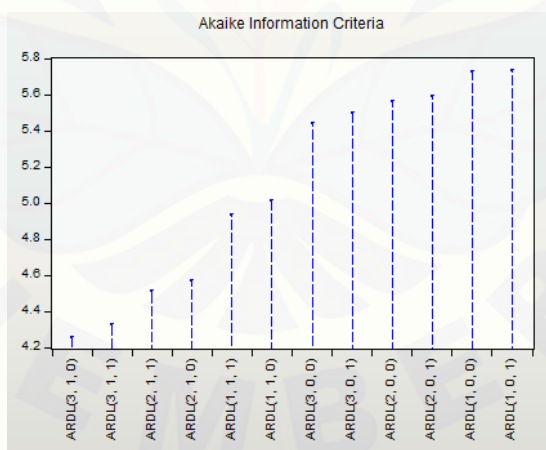
Trade (T)	Level	Intercept	-2.510594	0.1219	
	First Diff	Intercept	-8.868588	0.0000	Stationer
Foreign Direct Investment (FDI)	Level	Intercept	-2.303508	0.1767	
	First Diff	Intercept	-5.511589	0.0001	Stationer

The EG data is stationary at the original level, while the T and FDI data are stationary at the first difference. This is indicated by the Augmented Dickey-Fuller Test, with a probability of 0.0058, a probability of less than 5%, in this case, the EG data shows stationary in the original data. The same thing happened to the T and FDI data which were stationary at the first difference from the original data. Likewise, if we test the stationarity of the three data simultaneously, the results are as follows:

**Tabel 3. Stationary Test**

Series	Prob.	Lag	Max Lag	Obs
EG	0.0000	0	7	33
T	0.0000	0	7	33
FDI	0.0001	0	7	33

The data of the three variables if tested stationary at the same time shows that prob < 5%, meaning that all three are stationary.



Picture 1. Optimum Lag Test

The optimum lag test is carried out to see which lag is suitable for use in the next test, from the picture above, it can be seen that lag 3 is the most recommended.

**Tabel 4. ARDL bounds test**

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)

F-statistic	29.57561	10%	2.63	3.35
K	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5

According to the findings of the ARDL model's Limit Test in Table 1.4, the F-statistic model value of 29.57561 is larger than the upper limit value at the 5% level and even greater than the upper limit values at the 2.5% and 1% levels. This demonstrates that the three variables examined in this research, namely economic growth, trade, and foreign investment, are long-term cointegrated, or that the three variables move in lockstep over time.

**Tabel 5.** ARDL analysis results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EG(-1)	-0.161425	0.101241	-1.594464	0.1239
EG(-2)	-0.580022	0.100773	-5.755721	0.0000
EG(-3)	-0.299346	0.090523	-3.306866	0.0030
T	0.017940	0.035637	0.503402	0.6193
T(-1)	-0.306415	0.039748	-7.708955	0.0000
FDI	1.731552	0.387963	4.463191	0.0002
C	-0.478557	0.332890	-1.437583	0.1635
R-squared	0.863243	Adjusted R-squared		0.829054

The adjusted R-squared value and the R-Bar-squared value of the ARDL model are relatively high, with an average of around 0.82 and 0.86. The adjusted R-squared value of 0.82 indicates that each of the independent variables in the specified ARDL model, namely trade and foreign direct investment, can account for 82% of the variance in the dependent variable of economic growth. This is an indication that this research model is good enough to be analyzed. As can be observed from the ARDL estimate findings, the EG(-1) variable has a coefficient value of -0.16, indicating that the previous year's economic growth factor is also a factor affecting economic growth. For instance, a 1% economic growth rate in the preceding year would result in a 16 percent decline in Indonesia's GDP. Economic growth in the previous year also played a more important role when compared to trade and foreign direct investment, where the coefficients were relatively larger than those of trade and FDI. The value of the trade coefficient is 0.17 which means an increase of 1 percent will increase by 17%.

### Conclusion

Indonesia is one of the developing countries that have an economic growth rate above the projected average world economic growth rate. The factor of trade and foreign direct investment is quite massive from 1985 to 2020 to encourage economic growth in Indonesia. The findings of the research utilizing the ARDL technique indicate that although two factors, trade, and foreign direct investment, have little influence on economic development, in the long run, they do have a considerable effect in the short run. According to the ARDL results, trade and foreign direct investment are critical for Indonesia's economic growth, but in Indonesia, a trade sector dominated by imports causes this variable to have a significant negative relationship with

economic growth, implying that the greater the proportion of trade, the lower economic growth in Indonesia.

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## The Role of Wongsorejo Integrated Industrial Estate Agglomeration in Banyuwangi Community Welfare Method of Content Analysis

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### Abstract

The purpose of this study is to examine the impact of agglomeration in the Wongsorejo industrial area on economic growth and income generation in Banyuwangi using news sources related to industrial areas and literature studies related to the impact of industrial estates on economic growth in general in various regions using reputable journals. We started our research by exploring using qualitative methods of content analysis using sources from reliable news related to industrial estates, economic growth, and the welfare of communities around the industry. Furthermore, conducting a literature review to understand the impact of agglomeration and industrial estates on economic growth and community welfare. We found that the Wongsorejo integrated industrial area in Banyuwangi opened up MSME business opportunities so that around the Wongsorejo integrated industrial area new MSMEs emerged that absorbed informal workers in Banyuwangi. The Wongsorejo integrated industrial area opens new job opportunities for tens of thousands of Banyuwangi residents, of course, economic activities in the Wongsorejo integrated industrial area have an impact on increasing taxes in Banyuwangi which is government revenue to increase infrastructure spending which also absorbs labor in Banyuwangi and increases social assistance. Where social assistance encourages consumption which has an impact on economic growth and infrastructure development also has an impact on economic growth. The increase in economic productivity as a result of the absorption of labor from the informal sector (MSMEs) and the formal sector Wongsorejo integrated industrial area encourages economic growth so that this push has an impact on improving the welfare of the people of Banyuwangi.

**Keyword :** Agglomeration, Industrial Estate, Community Welfare, Banyuwangi, Content Analysis Method

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### Introduction

Prayer (2000), explains that the company's functional area is a grouping of activities, which are homogeneous and coordinated, which are carried out to achieve organizational goals. Management, production, finance, marketing, and human resources are usually referred to as basic functions but are not the only ones due to the special characteristics of each company. Since functional areas are specialized units within the company, it is important to know and define which tasks and processes each one is responsible for, only in this way will it be possible to achieve a high level of efficiency that ensures the best organizational performance.

The functional areas of the enterprise are a set of related activities and processes, through which work can be better divided, therefore, they catalyze specialization, promote greater efficiency, and, at the same time, the achievement of organizational goals. In each functional area of the company, activities are grouped that by their nature belong to the same area of competence, that is, a specific set of tasks that seek to achieve a common goal, the strong relationship of which allows them to act. as if they were alone. It is common to think that functional areas and business departments are the same, but the difference is that the former consists of functions or groups of activities whereas the latter consists of jobs. It can be said that the functional area is concerned with what is done, while the department can be associated with the organizational structure that serves as the basis for coordinating the efforts of the people who compose it (Priyono, 2016).

Imagine that the same entrepreneur from the previous example is an excellent designer, carpenter, and installer, with whom the product becomes of high quality and according to the tastes of his client, but who systematically fails to meet the final delivery and also with the payment of materials. In this case, his outstanding production skills are overshadowed by his non-compliance with deliveries and payments, by which he will be able to see the number of new orders decrease, as his clients will not provide him with good references (there will be no word of mouth), as well as their cash flow. , by having to pay more to their suppliers, which ultimately translates into a loss of business objectives.

By understanding the functional areas of the company, it can be understood that when companies with various functions gather in an area, it will create efficiency and increase profits and build a more conducive business atmosphere and environment. Generally, this area is called an agglomeration.

One of the industrial areas as a form of agglomeration in Banyuwangi Regency is the Wongsorejo integrated industrial area. The beginning of the Wongsorejo industrial area was the Kapok Plantation in the Wongsorejo District which developed into an industrial area in the form of a factory and warehouse area capable of accommodating the operations of more than 200 industries on an area of 300 hectares (Wongsoredjo, 2022).

The development of agglomeration in Banyuwangi has an impact that needs to be studied considering that the manager of the industrial area is a private party that is certainly profit-oriented. What is the impact on economic growth and per capita income for the people of Banyuwangi?

### **Literature Review**

The concentration of people and resources in the city made possible, among other things, the birth of a market. This is because the economic and political system has developed around it. In this context, agglomeration and economies of scale emerge, making urban governance present a different kind of challenge. Most notable is reconciling increased demand and mobility with the need to reduce costs associated with them and to deal with technological and demographic changes (Pan, Zhang, Wu, & Tian, 2021).

An agglomeration economy expresses the benefits that can be derived from the proximity of resources or services. This happens because of the population density associated with cities. On the other hand, economies of scale emerge, which show the profits that firms gain from increased production due to increased demand. Faced with this need, companies react, for example, by investing in any machine or resource that speeds up the production process. These costs will be amortized over time to cover investment costs and benefit from increased demand served. In this context, economies of scale and agglomeration allow cities to concentrate jobs, wealth creation,

and, with that, household consumption and spending. Urban concentration supports increased activity and requires a series of positive effects that are the basis of economic growth (Yu & Liu, 2021).

One effect is the overflow of knowledge and learning, which helps the creation and accumulation of human capital in urban areas. This is because learning results from interactions between individuals, which causes agglomeration that supports the flow of ideas and streamlines the process. The same thing happens with technology. The agglomeration economy brings with it the high specialization of the metropolitan area in technology and knowledge-intensive sectors, such as electronic products, medicine, and financial services. In this sense, this specialization, together with the exchange of ideas, creates a favorable environment for the development of innovative products (Liang & Goetz, 2018).

Technological and human resource innovations in turn support the greater spread of technology in cities, compared to smaller populations. In particular, in urban areas, the use of digital technology is greater, and such is the impact. This set of factors is defined as the 'capital effect', an effect developed in urban areas that acts as a “point of gravity for the economy and employment, being a facilitator of innovation and growth, as well as an educational, socio-cultural, and scientific center”. These negative factors associated with the urbanization process are almost like a chain effect, triggered as proximity to the core of activity centers increases (Ai, Wang, Zhang, & Zhu, 2022).

Agglomeration in cities causes selling prices and rental prices to increase. High house prices make people tend to move to the outskirts of the city, which in turn increases travel time and congestion. Travel times and population density lead to increased levels of pollution in the largest cities. Finally, due to the greater inequality in income distribution observed in cities, proximity to wealth and a greater density of possible victims, conflict, and crime rates are, without a doubt, higher in urban areas (Okamoto & Sato, 2021).

Increasing demand from a growing population will pose challenges to sustainability, such as waste management and available resources, pollution reduction or accessibility to housing, and so on. Something that will help find a better balance between the positive and negative factors of urbanization for this reason this research needs to be done to see the impact of agglomeration on society.

### **Research methods**

We aim to examine the impact of agglomeration on the wongsorejo industrial area on economic growth and income generation in Banyuwangi using news sources related to industrial estates and literature studies related to the impact of industrial estates on economic growth in general in various regions using reputable journals. We refer to trusted online news and scientific articles from reputable journals as the data we review with a content analysis-based literature review

We started our research by exploring using qualitative methods of content analysis using sources from reliable news related to industrial estates, economic growth and the welfare of communities around the industry. Furthermore, conducting a literature review to understand the impact of agglomeration and industrial estates on economic growth and community welfare. The results of this qualitative study are the flow of influence which is presented in Figure 1 and the formulation of the hypothesis as a study of this study which is presented in Table 1.

### **Results and Discussion**

The results of the study of news and literature related to the Wongsorejo industrial area in Banyuwangi are presented in table 1 and the flow chart in Figure 1.

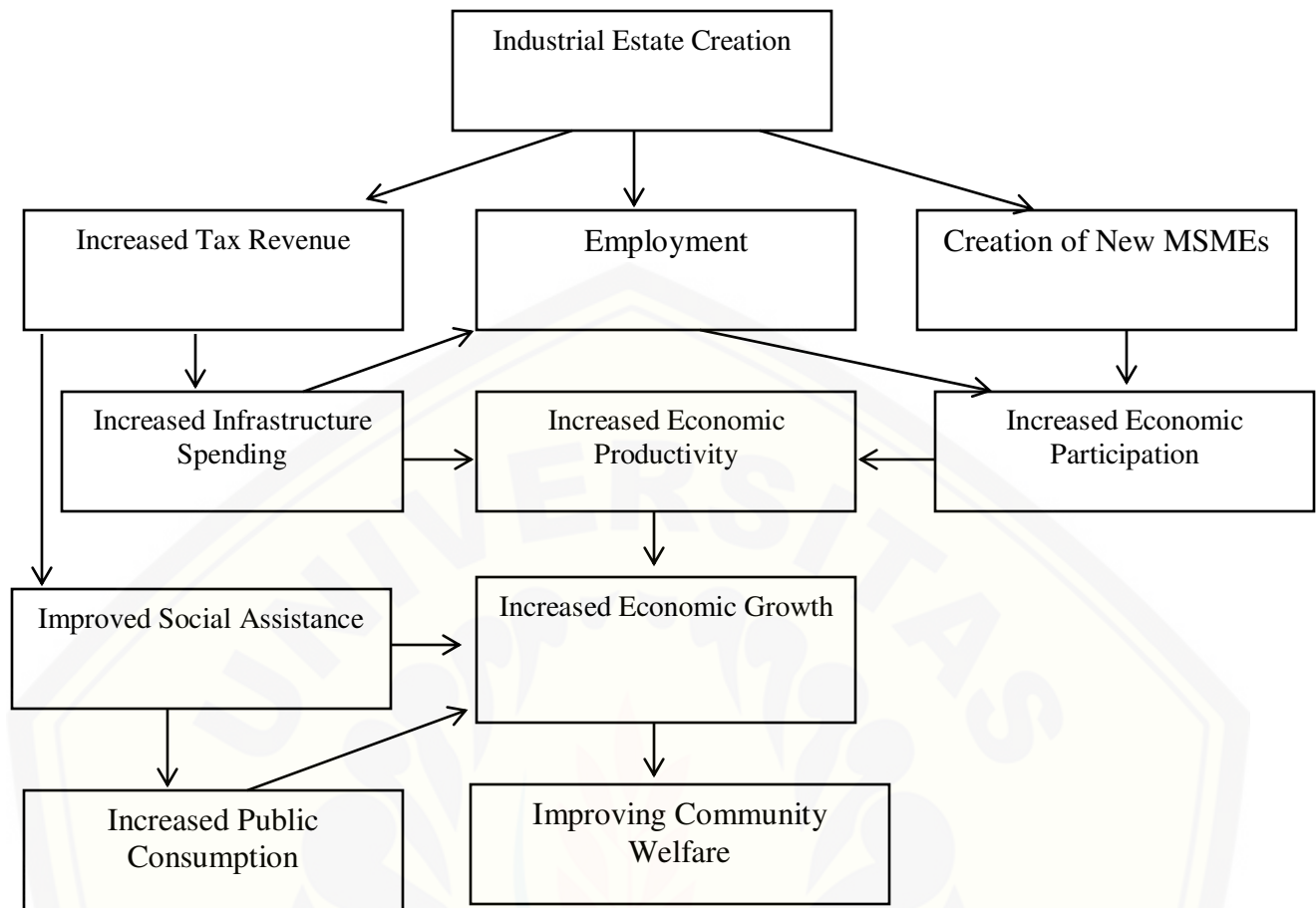
**Table 1.** Content Analysis

Theme	Content Analysis
Wongsorejo integrated industrial area has an impact on economic growth in Banyuwangi	Wongsorejo integrated industrial area provides economic potential for economic growth in Banyuwangi (Ripto, 2019).
Wongsorejo integrated industrial area increases the income of Banyuwangi residents and reduces unemployment	The Wongsorejo integrated industrial area opens up job opportunities for tens of thousands of Banyuwangi residents and increases new economic centers so that it has an impact on increasing income (Muzayin, 2019; Suara Merdeka, 2019; Utama, 2019)
Industrial Estates have an indirect impact on increasing people's income through taxes and increasing economic productivity	Industrial Estates create new economic centers that have an impact on increasing economic productivity which has a multiplayer effect as well as increasing tax revenues in the business sector so that increasing welfare through social assistance and increasing public goods has an impact on people's welfare (Zhang, Wang, & Strager, 2022; Zhang, 2002). Liu, Zhou, Chen, Liu, Cheng, Xue, & Zhang, 2022)

The development of industrial areas will certainly open a new business center that becomes the center of economic activity. The opening of a new industrial area in Banyuwangi is a positive thing as a driver of economic growth, opening new jobs and increasing people's income through the multiplayer effect of new economic activities born around the expanding industrial area. For example, the creation of new SMEs to fulfill employees and non-employees in the center of industrial areas, increasing demand for materials needed for SMEs created in new industrial areas, thus encouraging demand for food ingredients which are agricultural products so that the agricultural sector is also moved.

The impact of the new industrial area in Banyuwangi has an impact on reducing unemployment due to the existence of a new center of economic activity that absorbs labor. However, another impact is the increase in migration to the center of the new industrial area in Banyuwangi, namely the Wongsorejo integrated industrial area. In general, industrial estates have an impact as a driver of economic growth and have an impact on tax revenue which in turn encourages infrastructure development which automatically absorbs new workers and provides a multiplayer effect on the people of Banyuwangi. The increase in taxes also has an impact on increasing social assistance so that with direct cash assistance the level of public consumption increases and has an impact on boosting economic growth.

From the results of content analysis obtained through reliable news related to the Wongsorejo integrated industrial area and journals related to agglomeration and industrial areas, it is mapped into the flow of the impact of the creation of the Wongsorejo integrated industrial area on the people of Banyuwangi which is presented in Figure 1.



**Figure 1.** Impact Flow of the Creation of the Wongsorejo Integrated Industrial Estate on the Banyuwangi Community

The creation of industrial areas has an impact on the creation of new MSMEs around industrial areas which has an impact on increasing demand for MSME supporting resources including the agricultural sector. The creation of new industrial areas also has an impact on the creation of new jobs that affect employment. Absorption of labor has an impact on economic participation which affects economic productivity. Of course, the creation of new industrial estates increases the tax revenue derived from business taxes and other legal taxes. The increase in tax revenues will of course have an impact on increasing social assistance and increasing infrastructure spending. Where the increase in infrastructure spending has an impact on increasing labor absorption and has an impact on increasing economic productivity. Where the increase in productivity has an impact on economic growth. The increase in taxes also has an impact on increasing social assistance to the community which has an impact on consumption. Where increasing public consumption has an impact on economic growth and economic growth has an impact on people's welfare.

**Conclusions and Recommendation**

The Wongsorejo integrated industrial area in Banyuwangi opens up MSME business opportunities so that around the Wongsorejo integrated industrial area new MSMEs emerge that absorb informal workers in Banyuwangi. The Wongsorejo integrated industrial area opens new job opportunities for tens of thousands of Banyuwangi residents, of course, economic activities

in the Wongsorejo integrated industrial area have an impact on increasing taxes in Banyuwangi which is government revenue to increase infrastructure spending which also absorbs labor in Banyuwangi and increases social assistance. Where social assistance encourages consumption which has an impact on economic growth and infrastructure development also has an impact on economic growth. The increase in economic productivity as a result of the absorption of labor from the informal sector (MSMEs) and the formal sector Wongsorejo integrated industrial area encourages economic growth so that this push has an impact on improving the welfare of the people of Banyuwangi.

Suggestions for stakeholders, based on the findings of this research, it is appropriate for the flow of funds from economic activities to be properly monitored for the greatest prosperity of the people, especially the people of Banyuwangi. For other researchers, they can use the flow of influence from this study to be tested causally because this research is limited to a literature review by reviewing the literature using content analysis. In conducting content analysis, researchers use skimming and scanning techniques to capture the topic of each supporting scientific news article so that they can carry out content analysis and build the flow of relationships presented in this study.

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