

INDONESIA E-COMMERCE AND THE IMPACT ON THE ECONOMIC GROWTH

Fatty Rosyana Okatvia

¹ School of Business, Nanjing University of Information Science and Technology, Nanjing, China

ABSTRACT

Technological advancements have altered the way we do things. Most of them is the manner in which we purchase online. The internet therefore plays an important role in promoting economic and social interests. Not surprisingly, internet penetration has been on the rise for a decade now and is not expected to slow down. As a result of difficulties in building a fixed-line network in an archipelago, as well as a massive enhancement of the mobile network, smartphones are the main device to access the internet. The nationwide trend towards online communication offers opportunities in many digital areas, including e-commerce. Because of the internet, we no longer need to go straight to the store to get the products that we want. Electronic commerce through the Internet is a novel method of doing business. It has an significant influence on major industries such as communications, banking, and retail trade. The most significant effects could be correlated with less apparent, but potentially more pervasive, effects on everyday business operations rather than many of the more visible impacts. In this thesis uses the Auto-Regressive Distributed Lag (ARDL) to analyze the E-commerce impact to the Indonesia's Economic Growth from 1994-2020, with the result found that e-commerce that represented as the number of e-commerce sites as the supply indicator, and the increase of the transaction value also the population of internet users has positive impact on economic growth in indonesia. Furthermore, following by using the short-run and long-run relationship show that e-commerce has significant and insignificant impact on economic growth in Indonesia within some indicators.

Keyword -E-commerce, Economic Growth, Internet, GDP, ARDL

1. INTRODUCTION

In this modernized world, we could even surely access the use of technology. The technology development has tremendously lowered the cost and improved the speed of all the digital technologies that drive the Internet more than 30 percent per year (World Development Report, 2016). The use of technology has become part of life makes it easier to do their jobs. Also, has an effective economic behavior, both socially and economically. The growth of internet commerce or e-commerce was the form of economic development and progress. E-commerce means the use of electronics and technology to conduct the sales, exchange of products, services, purchases, transfer and information. The ideal E-commerce technology has given growth to a revolution in the circulation system (Qin, Z, 2010). The term of e-commerce is using the Internet to get the process transaction.

Information systems and technologies are based on e-commerce. With the rapid speed of the Internet, we can get all the information through the Internet. New technology such as the Internet of things and big data will persist in growing. It is also impossible to separate the Internet from cell phones and social media. By using a mobile phone, it makes it easier for us to shop and use social media to enlarge brand awareness in the middle of online customers, increase sales, facilitate word-of-mouth communication and ensure social support for online customers. In e-commerce, Electronic data interchange, known as EDI, is a system that helps the management supply chain in business (Manzoor, A, 2010). Electronic funds transfer or EFT is the digital transfer of money from bank to bank and using email to exchange the message.

E-commerce is growing rapidly with revenues of more than \$362 billion in 2012 and is expected to grow to more than \$542 billion in 2016. In China, as the world's biggest e-commerce market with annual online sales grow more than \$672 billion, following by the United States with \$340 billion and the United Kingdom is about \$99

billion (business.com, 2020). E-commerce is transforming the way people design, manufacture and deliver their products and services. Electronic commerce in Asia is not only in China, but also in India, Japan, and South Korea, which have the highest shares in global e-commerce revenues. Furthermore, other Asian countries, such as Indonesia and Vietnam, are witnessing rapid growth in e-commerce, which is being fueled by digital payments, which are becoming more common in the region. (Kinda, T, 2019)

In Indonesia, the e-commerce market growth annual is about \$7,62 billion, with 2,4% of the total retail in Indonesia. Most of the things about our daily lives are due to economic growth. The economic growth rate is required and is the primary source of improvement in the quality of living in a country. If economic growth is rapidly high, the goods to be produced will also be increased. Economic growth is quite critical for the growth of economic development as well as a process for a better country (Arifin, 2020).

The influence of e-commerce will, therefore, also extend beyond the business activity of human society. Baytar, U. (2015) The following basic factors of e-commerce that influences economic growth (1) Job Creation (2) Electronic payments (3) Supply chain management (4) Small and Medium Enterprises (SME) Contributions (5) Research and Development (6) Logistic (7) Internet usage factors (8) Information and Communication Technology (ICT) Investment (9) Cost saving. Regardless, the impact of e-commerce, same thing as a coin. With two sides of the coin, the effect of e-commerce also has two sides, good and bad. For the good side is we can purchase goods without having to worry about coming to the shop directly, only need to open an online application, then choose a product and wait for the item to arrive, but on the bad side according to entrepreneur Mr. Chairil Tanjung, due to the transaction and the services it doesn't require human resources, so there are possibilities that will increase the unemployed in Indonesia (Audriene, D, 2017).

This thesis will explain more about how e-commerce can impact the economic growth in Indonesia within some indicators, with both the challenge and the prospect of e-commerce in Indonesia in the period of time. The thesis is ordered in the following manner, Section 2 provides a concise overview of the current literature, followed by Section 3 which outlines the approach, Section 4 which displays the results, and Section 5 which draws the inference.

2. LITERATURE REVIEW

2.1 E-commerce

Dr. John R. Goltz and Jeffrey Wilkins of electrical engineering invented e-commerce. CompuServe launched some of the first modes of email and internet access to the public in the 1980s and dominated the e-commerce world until the mid-1990s. (Big Commerce, 2020). E-commerce is inextricably linked to the past of the internet. When the internet was first made available to the public in 1991, online shopping became a reality. Amazon was the first e-commerce service in the United States to begin selling merchandise online, and thousands of companies have since followed suit. The narrative of amazon.com, one of the leading retail businesses, encapsulates the dot-com history of e-commerce. Following Amazon's entry into the virtual marketplace, both conventional (brick and mortar) and recently formed e-commerce firms followed suit, offering a wide range of online goods and services.

The exponential growth of e-commerce in almost every business area did not mean the end of the physical marketplace, but rather provided solutions and enhancements to traditional commerce. E-commerce has opened up previously inaccessible overseas market markets. The rapid expansion promoted the widespread utilization of information and communication technologies and the innovation of new ones. Electronic Data Interchange (EDI) is considered an antecedent to e-commerce was originating before web commercialization within the mid-1990s (Becker, S, 2008). It was taken toll efficiencies and information correctnesses that previously were troublesome to realize.

E-commerce presented open systems for coordinates information trade in this way, tending to the EDI innovation obstruction with the benchmarks like other media-rich formats utilized by today's data and communication innovations. Within the 1990s, e-commerce quickly developed in ubiquity as shoppers, businesses, financial specialists, and the open responded to the media buildup. Others recognized it is as a business opportunity for advertising items and administrations in residential and worldwide markets that within the past were not

reasonable or non-existent. Laudon, K & Laudon, P. (2014). Electronic commerce or E-commerce is digitally enabled commercial transactions between organizations or individuals using the internet and website to return products or services. E-commerce began in 1995 with the first internet portals, "Nestcape.com," receive the first advertisement from a major company and publicize this idea to the world.

E-commerce is described as using the internet and the web to conduct business in a global marketplace. Electronic business is a new term that is mostly used interchangeably with e-commerce, despite the fact that it encompasses much more than online purchase business. E-commerce has altered the way businesses operate. The financial transaction is being completed without the intervention of the banking industry, which is needed. For the past two decades, commerce in, for all intents and purposes, each division of the world economy has profited from electronic commerce innovations. The intrigue in electronic commerce is generally later. Hence the definition of the rubric of e-commerce is bound to be disputable and is still advancing. By commercial, we allude to activities that look to make arm's-length exchanges between firms and people, moreover, including the trade of cash, merchandise, or commitments. In this manner, our definition of e-commerce deliberately avoids inter-organization frameworks such as email, phone, fax, or webphone and inside computing finished by bookkeeping, deals, stock, treasury, personnel, or official data frameworks (Clark, T & Westland, J, 2000)

There are a few types of e-commerce, such as; B2B, B2C, C2C, Social E-commerce, M-commerce, and Local e-commerce. According to Laudon, K & Laudon, P. (2014). There different main type of e-commerce;

- Business-to-business (B2B)

Business-to-business e-commerce is the largest category by far and is expected to grow faster than B2C. A company offers the goods or service to another business through a B2B business model. The retailer is often the end-user, but more frequently than not, the dealer resells to the customer. B2B is expected to rise at a higher rate than B2C. The two components are e-infrastructure such as; logistics, application service providers, outsourcing of function of e-commerce, auction solutions software and content management software. The other is E-market that defined as web sites as the sites of buyers and sellers (Gupta, A. 2014)

- Business-to-consumer (B2C)

Business-to-consumer e-commerce is engaged in selling goods and services to individual customers (Laudon, K & Laudon, P, 2014). B2C reduce transaction cost by increasing consumer access to information also authorized consumers to discover the price for product or service. (Gupta, A. 2014)

- Consumer-to-consumer (C2C)

Consumer-to-consumer e-commerce has involved the electronically facilitated transaction between consumers through some third party with charges a flat fee. C2C is expected to increase in the future to cut the cost of another company (Botha, J, Bothma, C & Geldenhuys, P. 2008).

2.2 E-commerce in Indonesia

Digital technology is becoming the center of life, work, culture, and identity in Indonesia. Indonesian as one of the world's most enthusiastic users of digital technology, with an average age of 28 and a rapidly growing urban middle class (Tapsel, R & Jurriëns, E, 2017). The average Indonesian wastes four hours a day surf the Web on his mobile device twice the average of the USA. Indonesians also recognized digital technology with excitement and are one of the world's largest social media users, such as Facebook, Instagram, Line, Twitter, and Youtube. The rise of digital Indonesia has a significant impact on Indonesian citizens, including the format of new jobs, increased accessibility, and greater connectivity to global society. (McKinsey & Company, 2018).

The rapid growth of e-commerce in Indonesia has benefited both companies and customers, as well as society. For business owners, e-commerce has a beneficial effect in the form of lower operating costs and increased market share, allowing revenues to be maximized and business growth to be simplified. McKinsey & Company (2018). Two of the most active cities for Twitter in the world – Jakarta, and Surabaya come in first and sixth place, respectively the most number of billion-dollar tech startups in Southeast Asia - including, most notably, Tokopedia GO-JEK, Traveloka, and Bukalapak. Thirty million Indonesians today are transacting online, creating a market of at least \$8 billion. The market could grow to \$40 billion upwards in the next five years. The current online commerce

market consists of two key models: e-commerce platforms such as Tokopedia, Shopee, and Lazada and social commerce, which involves the buying and selling of physical goods through a social media platform such as BBM, Facebook, Instagram, Line, and WhatsApp. Goods can be classified for sale in the conversational commerce model, but payment and distribution are done separately. Online commerce accounts for 60% of all revenue, with social commerce accounting for the remaining 40%.

Electronics, apparel, fitness, and beauty are the top three product groups for online purchases, accounting for 70% of total sales. Women account for 35% of online retail sales, although they account for just 15% of offline retail revenue. The provinces outside of Jakarta will spend 10% more than Jakarta on average, which means that if the average consumer in Jakarta spends \$10 tomorrow, the average consumer outside of Jakarta will spend \$11. The rate of new consumption could grow above 30% since online commerce delivers more choices, greater accessibility, and more competitive prices for consumers. In 5 years, the online commerce market in Indonesia will be five times larger than today. This has significant implications for all aspects of Indonesian life, including the job market by 2022.

According to Merchant Machine (2019) Indonesia leads the pack of these nations, with a 78 percent rise in 2018. The fact that Indonesia has more than 100 million internet users is one of the factors driving the growth of e-commerce. Indonesians spend an average of US \$ 228 per person on online shopping sites, which equates to approximately Rp. 3.19 million per person. 17.7 percent of respondents spent their money on plane tickets and online hotel reservations. Clothing and accessories bought by as many as 11.9 percent of respondents. Health and beauty products are the third most common group, with 10% of respondents choosing them. Mexico is the second fastest growing e-commerce region, with a 59 percent increase in 2018. Meanwhile, the Philippines ranks seventh, with a 51% increase in e-commerce.

Damuri, Y, Negara, S & Azali, K. (2017) E-commerce in Indonesia is expanding and capturing a greater share of the revenue. Several factors, such as the massive development of related infrastructure, have improved e-commerce growth in Indonesia. E-commerce would be seen as an alternate marketing platform for SMEs, and the government is ambiguous about the growth of e-commerce. There are still many challenges for future e-commerce growth. Priorities for addressing the challenges that Indonesia faces in online commerce include resolving logistical bottlenecks, promoting more cashless payments, and taking more micro, small, and medium-sized businesses online. Finally, Indonesia can use the lessons learned from online commerce to strengthen its overall digital economy (Mckinsey & Company, 2018). According to Daniel, W. (2019), Bank Indonesia registered the value of online store transactions in January 2019 alone, which totalled Rp.8.204 trillion. This increased dramatically, by 135.8 percent, as compared to January of last year.

2.3 Economic Growth in Indonesia

Economic growth, the continuing increase in GDP per capita incomes of purchasing power. Economic growth consistently involves change. The pre-growth world contained stagnant economies that grew in size or scope but not in form, while growth economies entail ongoing systemic transition. (Hudson, E, 2020). GDP, or Gross Domestic Product, is the overall market value of all final products and services produced within a country during a given period. It involves both private and public consumption, as well as private and public spending, as well as exports less imports. GDP is the most often used indicator of economic development and is an excellent predictor of a country's economic health. Economic growth (GDP growth) is the percentage change in real GDP that accounts for inflation in the nominal GDP statistic. As a consequence, true GDP is also known as GDP adjusted for inflation or GDP in constant rates. (Focus Economics, 2020).

Annual percentage growth rate of GDP at retail rates dependent on constant local currency. The aggregates are calculated using constant 2010 US dollars. GDP is the amount of the total production contributed by all resident manufacturers in the economy plus all export taxes and minus any subsidies not included in the product value It is measured without taking into account depreciation of manufactured products or loss and deterioration of natural capital. In Indonesia, the growth rate of GDP in 2019 was 5.02 percent, a 0.15 percent decrease from 2018. (World Bank, 2020).

Economic growth is one indicator of the success of development in an economy. The welfare and progress of an economy is determined by the amount of growth shown by changes in national output. The existence of a change in output in the economy is a short-run economic analysis. According to Adam Smith, the government serves

three primary roles in the economy: (1) preserving domestic stability and defence; (2) enforcing justice; and (3) providing products that the private sector does not offer, such as utilities and public services. (Ma'ruf, A & Wihastuti, L, 2008)

Todaro, M & Smith, S (2012) Human capital, including health, education, and skills, is critical to economic development and human development. However, if long-term economic growth is to be achieved, concomitant and complementary human resources, technical, social, and institutional changes must occur. There may be some "benefits of backwardness" in growth, such as the ability to use current, tested innovations rather than reinventing the wheel, and even leapfrogging over older technology norms that developing countries have become enslaved to. Model of Harrod-Domar Expansion The rate of GDP growth is directly proportional to the national net savings rate and inversely related to the national capital-output ratio in a functioning economic partnership. In addition, labour force expansion and technical innovation are two other components of economic progress. The capacity of a country to develop its natural resources as well as initiate and sustain long-term economic growth is defined by.

Borowy, I, & Schlmezer, M. (2017). Since 1820, global economic development has radically changed human life and the world, and modern communities, markets, and civilizations are increasingly founded on the assumption of continued exponential growth. Global growth theory studies the emergence and fall of economic structures. Its primary task is to clarify economic growth and the interdependence of growth with other factors such as education policy, research and development policy, economic structure, income allocations, saving, job productivity, population, wealth, money, sexual division of labor and consumption, public goods, and tax structure. Furthermore, the rapid transformations from agriculture to industry to services in association of modern economic growth. In association with rapid economic structural urbanization, shifts from home, work to employee status, an increasing role for formal education, increase international trade, and a reduces reliance on natural resources. In particular, that government plays a significant role in providing institutions and infrastructures in sustaining economic growth and development. Syahputra, R (2017) Indonesia as a developing country, is actively implementing development in a planned and gradual manner, without neglecting equity and stability efforts. National development seeks to achieve a fairly high economic growth, which in turn allows the realization of an increase in the standard of living and welfare of all the people. Economic growth in Indonesia from 2004-2014 continue to fluctuate. The highest Fluctuate GDP In 2014 is 7,98% and the lowest in 2009 is 4.54%. the lowest economic growth in Indonesia 2009 was caused by the global economy that still experiencing the pressure from the crisis confronted the economy Indonesia is on some challenges which it is not mild in 2009.

According to Ginting, E & Aji, P (2015) Indonesia Economic Growth factors by field. Development was primarily driven by the non-tradable services sector on the supply side, mirroring the dominant contribution of consumption on the demand side. From 2005 to 2014, services contributed an average of 3.4 percent per year to growth. The telecommunications and transportation sectors continued to expand by double digits. The financial sector, commerce, hotels and restaurants, and other services all grew rapidly, aided by an expanding middle class and rapid urbanization. Since Indonesia is a major producer of rubber and palm oil, the agriculture sector benefited from a commodities boom. Because of the poor output of other food products, the sector's growth was well below the national average, accounting for only 0.5 percent of annual GDP growth. For several years, the oil and gas sector has been a drag on productivity, contracting by 1.3 percent per year on average over the last decade due to ageing oilfields and declining investment.

The World Bank (2020) Indonesia as one of the largest economy in southeast asia with diverse archipelago nation of more than 300 ethnic group has charted impressive economic growth since overcoming the Asian financial crisis of the late 1990s. In recent years, the Indonesian economy has been growing greatly. It recovered from the 1997 Asian financial crisis and expanded at a 5.2 percent annual rate from 2001 to 2008, outperforming other major Southeast Asian economies. (Hil, H & Khan, M & Zhuang, J, 2013).

All this progress, encouraging inclusive and long-term economic growth in Indonesia remains a challenge. Poverty persists, inequality and regional pay disparities continue, and quality jobs are limited.. To address these challenges, the Government of Indonesia's medium-term policy objectives include cultivating economic prosperity in order to promote sustainable and balanced economic growth; promoting public infrastructure and social services; creating dependable and productive human capital; addressing environmental and climate change; and supporting regional development. (Ginting, E & Aji, P, 2015).

2.3 The Impact E-commerce on Economic Indonesia

E-commerce has powered substantial growth in Indonesia, accounting for 54% of total growth. This meteoric rise has more than offset declines in Travel, Transportation, and Food Delivery. Overall, GMV is forecast to hit \$44 billion in 2020, a rise of 11% year on year. Looking ahead to 2025, the overall economy is expected to hit US \$124B in size, resuming its 23 percent CAGR. (Google, Tamasek and Bain, 2020). Indonesia, the world's most frequent consumer of social media platforms such as Facebook, Instagram, Line, Twitter, and Youtube, has a thriving digital environment that includes online shopping, ride-sharing services, media delivery, and financial services. One of most billion-dollar startups in Southeast Asia, such as Bukalapak, Go-Jek, Tokopedia, and Traveloka, have had a major effect on the global community by creating new jobs, improving access to resources, and increasing accessibility. Indonesia should benefit from the experiences of other countries about the conditions that support a flourishing online commerce ecosystem. Generally speaking, we believe Indonesia has space for improvement in all fields, including logistics and infrastructure, payments, MSME digital participation, local talent, and investment climate. (McKinsey & Company, 2018).

According to Wenas, There are at least five different factors influencing the development of the Indonesian e-commerce industry. First, Indonesia has the world's fastest growing middle class, with 55 million people now in the middle class, many of whom are consumerist and enjoy shopping. (Olavia, L, 2015). Second, Internet use in Indonesia is quite high; nearly 40% of Indonesians are experienced with and can use the internet. The history of the internet in Indonesia started in 1983, when Joseph Luhukay became the first person to create an internet link in Indonesia. The next stage in 1994 government and ISPs had permanent internet connections. The next two years, in 1996 there is the first internet café as called "Warnet". (Apster, 2007).

Third, the use of cellular phones in Indonesia is also huge, and mobile phones with Android technology are very affordable, with some reaching under Rp. 1 million; currently, cell phone users total 100 million. In Indonesia, there are 195 million mobile users but only about 30 million online shoppers. Fourth, the government is constructing many infrastructure projects such as toll roads and docks, as well as infrastructure construction that will allow the distribution of goods outside of the capital. delivery is the most important thing because this delivery ensures that the goods ordered by the customer can be sent on time (Yasmin, G, 2019). By the end of 2020, the gross merchandise volume (GMV) for online transactions is expected to hit USD 130 billion. The expansion of e-commerce is a significant driver of growth in the cross-border and domestic road freight logistics markets. Increasing the number of trucks to meet the growing demand for road freight transport. In the coming years, the population of freight trucks is projected to increase by 50% per year (ReportLinker, 2021)

Last, for the transaction system in Indonesia already develop with cash or non-cash by now. Bank Indonesia (2021) Payment systems continue to evolve following the evolution of money with 3 driving elements, namely technological innovation & business models, community traditions, and authority policies. In every transaction, it is evident that electronic payments are increasing when shopping online. Even though shopping is done offline, such as in shopping centres, most (70 percent) of respondents make payments electronically. Currently, the type of payment that is mostly made when shopping online is by way of transfer. money via internet banking or mobile banking by 37 percent, this method has shifted the transfer method via ATM by 20 percent. Meanwhile, electronic money is in third place as a means of payment when shopping on e-commerce. (Tempo.co, 2021)

The next point to mention is that the exponential rise of e-commerce can be a double-edged sword. In the one hand, global digitalization seeks to boost international trade by enabling consumers and vendors to access information from a wide range of geographical locations at a low cost and in a limited period of time (Chen & Kimura, 2017). Also, Lauden, K & Trevor, C (2017) E-commerce technology enables commercial purchases to cross ethnic, geographical, and national borders even more easily and affordably than conventional commerce. Also, Galindo, M., Guzman, J., and Ribeiro, D. (2009) argue that the increased penetration of the internet and quicker internet connections in e-commerce would have an effect on GDP growth year after year.

Dholakia, P. (2015) The incredible facility of a large range of goods and services that can be bought on the Internet is making shopping more lucrative and convenient as consumers' incomes grow. We assume that the ease of use of transaction processes would help to promote and encourage the adoption of electronic commerce. As a result, there is a lot of work being done to continuously redesign and review the process in order to make it as quick and convenient for the customer as possible. In addition, Jurriëns, E & Tapsell, R (2017) The conversion of things to digital information transforms in the economy are the transform of the market, transaction, and shift corporate-

centric capitalism to crowd-centric capitalism. the easier to establish an accurate digital representation of the asset and those involved in the transaction, the fast it is for a marketplace to emerge.

The Commonwealth of Australia (2018). The four factors that driven the structural changes in Indonesia. first, there has been a rise in mobile penetration as a result of the availability of low-cost smartphones. Second, leading e-commerce firms are focusing on an expanding middle class with more disposable income. Third, large Chinese and Western companies have invested at least US\$2.5 billion in e-commerce sites. Fourth, the exponential evolution of payment infrastructure, which enables customers who do not have bank accounts (unbanked consumers) to conduct online transactions. There are the four factors that driven the structural changes in Indonesia.

3. DATA COLLECTION AND METHODOLOGY

3.1 Data Collection

According to Taylor, G. (2005) Quantitative research method is more statistical method than qualitative, this thesis using the data source from World bank, Iprice, Katadata, Indonesia Internet Association Develops (APJII) and Databoks. The type of this analyse is the correlation between Growth Domestic Product (GDP) on E-commerce in Indonesia with three variables for such as the number of internet user in Indonesia, the total transaction value also the development platform e-commerce from year to year. Interpretations of data are employed to report the findings as well as determine what hypotheses are significant by using An Autoregressive Distributed Lag (ARDL). For the historical data source the author using the secondary data that include the second hand information from e-book, journal and website.

3.1 Methodology

The purpose of this method is to analyze the impact of e-commerce on economic growth Indonesia from 1994 – 2020. The regression of this thesis using the Auto-Regressive Distributed Lag (ARDL). Pesaran, M & Shin, Y (1999) Even more theoretical and methodological research in economics has focused on econometric study of long-run relationships. When the variables in the long-run relationship of interest are trend-stationary, it is common practice to de-trend the series and model the de-trended series as stationary autoregressive distributed-lag (ARDL) models. Estimation and inference about the model's long-run properties were then performed using regular asymptotic normal theory.

In this regression will describe the correlation between dependent and independent variable on short-run and long-run. The author execute three test before using the ARDL model. First, execute the multicollinearity with Variance Inflation factor (VIF). Second, verify is there any stationary or non-stationary variable with Augmented Dickey Fuller (ADF) model. Third, cointegration test with Bounds Testing Cointegrations to observe the time series data that digress from the average value in short-run and tend to work together in long-run.

ARDL are regular least square regressions that use both dependent variable and explanatory variable lags as regressors (Greene, 2008). While ARDL models have been used in econometrics for decades, in current history they have gained prominence as a method of exploring cointegrating relationships between variables through the work of Pesaran and Shin (1999). According Gujarati (2004) ARDL is the regression model that using the past and present value (lag) of the explanatory variable put more the dependent variable lag between the explanatory variable. Therefore with the resulting the exact time series data, this model can differentiate short and long-run dependent variable in one of the independent variable. Below the equation of the long run estimation

$$GDP_t = \beta_0 + \beta_1 INTJ_1 + \beta_2 SITUSE_2 + \beta_3 TVAL_3 + \varepsilon_t \quad (1)$$

with:

GDP_t : Dependent Variable

β_0 : Constanta

$\beta_1 \beta_2 \beta_3$: Coefficient regression

$INTJ_1, SITUSE_2, TVAL_3$: Independent Variable

ε_t : Regression Equation Error

Table 1. Variable and Source

Variable type	Variable name	Measure	Source
Dependent	Growth domestic product (GDP)	Million	World Bank (2019)
Independent	Internet User (INTJ)	Million	World Bank (2019), Lokadata (2017)
Independent	E-commerce platform (SITUSE)	Unit	iPrice (2021)
Independent	Transaction value (Tval)	Million	Databoks (2021)

Source: the author

In this thesis, the author includes a variable that can state the development of e-commerce with the large number of e-commerce sites in Indonesia since the year which has had a fairly good growth rate from 1994- 2020. in addition, the number of producers is one of the indicators of the transaction. value. Even though e-commerce has provided customers with a wider range of goods and has served people's material and cultural needs to a larger degree, a growing number of buyers have been interested in online shopping, increasing consumption spending. (Liu, S, 2013). However, for this thesis, the author uses the number of internet users as an indicator of the number of consumers of Indonesian e-commerce.

Astuti, P & Saputro, D (2018) If $\square\square$ and $\square\square$ are co-integrated, then there is a long-run relationship between the two variables. In the short-run, there may be an imbalance (disequilibrium) between the two variables. Based on the Granger Representation Theorem, if $\square\square$ and $\square\square$ are cointegrated, characteristic the short-run relationship between the two can be expressed in the form of an Error Correction Model (ECM).

Within using Error Correction Model Engle-Granger

$$\Delta GDP_t : \beta_0 + \beta_1 \Delta INTJ_1 + \beta_2 \Delta SITUSE_2 + \beta_3 \Delta TVAL_3 + \beta_4 EC_{t-1} + e_t$$

(2)

Where:

$$EC_{t-1} = GDP_{t-1} - (\alpha_0 + \alpha_1 INTJ_{t-1} + \alpha_2 SITUSE_{t-1} + \alpha_3 TVAL_{t-1})$$

(3)

With:

EC_{t-1} : Disequilibrium Error

β_0 : Constanta

β_1 : Short-run Coefficient

α_1 : Long-run Coefficient

e_t : Error Component in EC Engle-Granger Model

β_4 : Unbalanced Coefficient correction in absolute value form that shows how much time to get the Balance Value

4. RESULT

4.1 Multicollinearity Test

For this result to fulfil the statistical requirements in multiple regression analysis based on Ordinary Least Square (OLS) in time series data, this thesis using multicollinearity test. Multicollinearity is a critical threat, we must consider the bias from the probability or the specification error. From the estimate result, VIF from each independent variable is lower than 10. So, it can be concluded that there is no multicollinearity on this regression.

Table 2. The Result of Multicollinearity Test

Variable	R-squared	VIF	Result
INTJ	0.000921	6.281735	Non- Multicollinearity
SITUSE	0.010318	5.086805	Non - Multicollinearity
TVAL	0.086407	6.921612	Non -Multicollinearity

4.2 Unit Root Test

Dickey, D & Fuller, W. (1979) demonstrate that, under the null hypothesis of the unit root, this statistic does not obey the traditional student t-distribution and results asymptotic results and simulates essential values for different test and sample sizes. ADF Result (table 3) show that all variable not integration on the same level. Furthermore, the variable integrated on the varied level. by using the ADF method because this method ignores the requirement that the variables in the model must be integrated in the same order as long as they do not contain integrated variables in the second difference which is suitable for the ARDL model.

Table 3. The Result Of ADF Unit Root Test

Variable	Prob. ADF Test		Result
	Level	First difference	
GDP	0.0565	0.0000	I (0) Significant on 1%
INTJ	1.0000	0.6565	1(0) Significant on 10%
SITUSE	1.0000	0.0001	1(0) Significant on 10%
TVAL	0.0063	0.9835	1(1) significant on 10 %

4.3 Cointegration Test

Before testing the cointegration it is better to look at the ARDL value. From (Table 4) the f-statistic value is less than 0.05, then the data is stated to be significant and added with a high r-squared value of 0.799534. To interpret the GDP indicator as dependent on independent variables such as the number of internal users (INTJ), the number of e-commerce sites (SITUSE) and the number of value transactions (TVAL) as follows. Interpretation of INTJ (-1) affects GDP (-1) which is 0.717985 (positive) if the INTJ value increases by 1 percent, then GDP will increase by 7%, if SITUSE increases by 1 percent then GDP will also increase by 5% and for TVAL if it increases 1% then GDP will fall by 10%.

Table 4. ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	-0.422639	0.269276	-1.569539	0.1773
GDP(-2)	-0.478944	0.229479	-2.087095	0.0912
GDP(-3)	-0.359853	0.234572	-1.534083	0.1856
GDP(-4)	-0.278369	0.215583	-1.291241	0.2531
INTJ	-0.214129	0.376720	-0.568405	0.5943

INTJ(-1)	0.717985	0.846661	0.848019	0.4351
INTJ(-2)	0.586832	0.733153	0.800422	0.4598
INTJ(-3)	-1.164639	0.676934	-1.720463	0.1460
SITUSE	0.487521	0.219144	2.224660	0.0767
SITUSE(-1)	0.515391	0.332383	1.550594	0.1817
SITUSE(-2)	0.341090	0.665241	0.512731	0.6300
SITUSE(-3)	0.612339	0.830098	0.737671	0.4939
SITUSE(-4)	5.685824	2.935431	1.936964	0.1105
TVAL	-5.141132	8.422477	-0.610406	0.5683
TVAL(-1)	-10.36408	8.239360	-1.257874	0.2640
TVAL(-2)	4.837160	12.78160	0.378447	0.7206
TVAL(-3)	11.19269	11.62994	0.962403	0.3800
C	-2.127676	1.931577	-1.101523	0.3208
R-squared	0.799534			
F-statistic	0.468023			

From (Table 5), the results of the first regression (1) test show that the long-term relationship that occurs in the GDP indicator and the independent indicator of the development of the number of e-commerce sites is quite significant, while for other indicators such as the number of internet users that have no effect and are insignificant. Another, comparison with the indicator of the number of transactions on e-commerce sites is quite influential but not significant. However, there is a possibility that the integrated short-run model cannot be rejected at all, such as the influential and significant indicators of internet users, with other indicators such as the number of internet users and the value of the number of e-commerce transactions which do not have a positive but significant impact.

Table 5. ARDL Cointegration and long run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.127676	1.931577	-1.101523	0.3208
GDP(-1)*	-2.539805	0.525270	-4.835234	0.0047
INTJ(-1)	-0.073952	0.178000	-0.415461	0.6950
SITUSE(-1)	7.642165	3.951659	1.933913	0.1109
TVAL(-1)	0.524643	13.53344	0.038766	0.9706
D(GDP(-1))	1.117166	0.376003	2.971160	0.0311
D(GDP(-2))	0.638223	0.288418	2.212839	0.0778
D(GDP(-3))	0.278369	0.215583	1.291241	0.2531
D(INTJ)	-0.214129	0.376720	-0.568405	0.5943
D(INTJ(-1))	0.577807	0.662864	0.871683	0.4233
D(INTJ(-2))	1.164639	0.676934	1.720463	0.1460
D(SITUSE)	0.487521	0.219144	2.224660	0.0767
D(SITUSE(-1))	-6.639253	3.802442	-1.746050	0.1412
D(SITUSE(-2))	-6.298163	3.409794	-1.847080	0.1240
D(SITUSE(-3))	-5.685824	2.935431	-1.936964	0.1105
D(TVAL)	-5.141132	8.422477	-0.610406	0.5683
D(TVAL(-1))	-16.02985	22.20291	-0.721971	0.5027
D(TVAL(-2))	-11.19269	11.62994	-0.962403	0.3800

4.4 Bound test

1. For the bound cointegration test, If the measured f-statistic exceeds the critical value for the upper bound $I(1)$, we may infer that cointegration exists. There is a long run relationship, the null hypothesis must be rejected. Calculate the long run formula, which is also the error model (ECM)
2. If the measured f-statistic is less than the critical value for the lower bound $I(0)$, we can infer that no cointegration exists, and hence no long run relationship exists. Rejecting the null statement is not a good idea. Estimate the autoregressive distributed lag (ARDL) model in the short term.
3. If the f-statistic was between lower bound of $I(0)$ and the upper bound of $I(1)$. The result is deemed inconclusive.

According to (table 4) the result of F-statistic value is 5.03 that means greater than $I(1)$, can be concluded that there is cointegration for a long run relationship we can use the second regression (2)

Table 6. Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic k	5.0521153	10%	2.37	3.2
		5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

4.5 Estimation result for the short-run and long-run model

In long-run result (Table 7), With the number of e-commerce sites in Indonesia currently still not having a negative impact on Indonesia's economic growth in the long-run, this is added to the indicator of the number of e-commerce transactions in Indonesia which also does not have a positive effect on Indonesia's economic growth. Both of these indicators also have a prob value below 5 percent which indicates that from this value the two indicators still have no significant effect on the growth of the Indonesian economy, in contrast to the indicator of the number of internet users who will continue to have a positive effect as time increases with a prob value which is also significant. This indicates that in the long-run this indicator will continue to influence Indonesia's economic growth.

With the number of e-commerce sites in Indonesia currently still not having a negative impact on Indonesia's economic growth in the long-run, this is added to the indicator of the number of e-commerce transactions in Indonesia which also does not have a positive effect on Indonesia's economic growth. Both of these indicators also have a prob value below 5 percent which indicates that from this value the two indicators still have no significant effect on the growth of the Indonesian economy, in contrast to the indicator of the number of internet users who will continue to have a positive effect as time increases with a prob value which is also significant. This indicates that in the long-run this indicator will continue to influence Indonesia's economic growth.

Table 7. The result of Long-run estimation

Dependent variable GDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTJ	0.026746	0.030347	0.881334	0.3873
SITUSE	-0.014135	0.101580	-0.139147	0.8905
TVAL	-0.148984	0.293951	-0.506833	0.6171
C	2.517917	1.090705	2.308522	0.0303

If the Prob. Is less than 0.5 percent it means significant, For the Short-run results (Table 8) there are several indicators that are influencing enough but not significant for the short-run. Such as indicators of internet users and also the development of e-commerce sites in Indonesia for the short-run have had a positive effect on economic growth in Indonesia, but the prob results are above 5% which should be significant, then the results must be below 5%, meaning that the value is still not significant enough for economic growth in Indonesia. Meanwhile, the indicator for the number of value e-commerce transactions in Indonesia has not yet a positive effect on Indonesia's economic growth. It also has a prob value that is not significant.

Table 8. The result of Short-run estimation

Dependent variable DGDGP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TVAL)	-0.041651	0.671000	-0.062073	0.9510
D(INTJ)	0.008432	0.126113	0.066858	0.9473
D(SITUSE)	0.007239	0.100384	0.072118	0.9431
RES(-1)	-0.770403	0.195346	-3.943791	0.0006
C	-0.122654	0.720137	-0.170320	0.8662
R-squared	0.393227			
F-statistic	0.000607			

4.6 Prospect e-commerce

From the results obtained regardless of the significance of the three indicators, that the influence of the growing number of internet users, as well as the increasing number of e-commerce sites today and the number of transaction values obtained from the e-commerce sector confirms that there is the influence of the three indicators on Indonesia's Economic Growth. These results also confirm that the number of e-commerce sites as seller and the number of internet users as buyer with the data from 1998 - 2020 shows that these two indicators have a positive effect on Indonesia's Economic Growth in a short time period. Although, the number of transaction value of e-commerce in Indonesia still has no effect on Indonesia's Economic growth in the short or long-run. This means, that the total revenue is still lowest on Indonesia's GDP.

McKinsey & Company (2018) Estimate the online commerce in Indonesia will grow substantially reaching up to \$65 billion by 2022. Even though, forecasting e-commerce is a bit difficult, particularly with changing

technology, regulations, and consumer habits. New trade agreements, such as the ASEAN, can make it easier for foreign interests to meet more Indonesian consumers and for Indonesian businesses to expand into new markets. Suhindarto, Andari & Aryani (2020) E-commerce activities also have a positive effect on the value of Indonesian trade to ASEAN partners and many Indonesians are very active in carrying out activities through e-commerce services.

Lusta, A. (2017) The effects of e-commerce on economic growth of Libya from 1999 – 2015, the result acquire that there is long-run relationship between the variable and e-commerce development has positive and significant impact on libya economic growth by using the Johansen cointegration test and impulse respons functions. In china, Qu, Lili & Chen, Yan (2014) within five e-commerce factor has significant correlation with Gross Domestic Product (GDP) and impacted to the economic growth and national government, business and consumer have to put the emphasis on e-commerce, grow the investment in infrastructure, Train e-commerce practitioners, increase online shopping, and encourage economic development to boost the level of e-Commerce.

Elseoud (2014) also researching the effect of e-commerce on economic growth in Saudi Arabia from 2001 to 2013 which was significant and had a positive effect on economic growth in Saudi Arabia in the private sector, but for the scale of the public sector stated that it was not significant and there was a negative effect. As the country side of Indonesia, according to Hamdan (2020) e-commerce has big impact on economic growth in Malaysia by pushing policies to stimulate the growth and expansion sector. The rapid development of e-Commerce provides a foundation for the growth of the computer industry, Internet technology industry, and logistics industry, resulting in more employment and related practitioners. Because e-Commerce provides new sources of funding to support the system and assist more businesses in surviving the economic downturn, we should be optimistic about the future of e-Commerce. (Liu, S, 2013)

According to Saunders and Brynjolfsson (2009) in the literature reviews examined that information technology played a significant role in productivity increases and was a key driver of economic growth. Indonesia, With a millennial average age of 28.6 years in 2016, the largest and most populous nation in South-east Asia, provides an appealing forum for retailers. Although the market is still in its early stages, internet access has provided some experience with online sales. One major challenge is the complexity and high cost of shipping merchandise across the archipelago, which consists of over 17,000 islands (Oxford Business Group, 2021). As a consequence of this, a lot of work being done to constantly redesign and revisit the process in order to make it as quick and easy for the clients as possible.

4.7 Internet Impact on E-commerce

From the results above, it can also be seen that the only indicator that has had a positive influence on Indonesia's GDP is the number of internet users. With the estimation in the short-run which has a positive effect, although not significant. However, in the long-run the data show that the current number of Indonesian internet users has a positive and significant effect where the prob value is below 5%. This is also a sign that the rapid development of the Indonesian internet is one of the factors for the growing economic growth in Indonesia. The enhancement of service quality is directly related to the overall communication quality. This is particularly important in international e-commerce. Typically, logistics integrators play a crucial role in the cross-border e-commerce delivery network since they stay at the stage that links different countries' online and offline supply chains. Connection cannot function properly without the participation of qualified providers, no matter how well-built the system is. (Chen & Kimura, 2017).

According to Saunders and Brynjolfsson (2009) in the literature reviews examined that information technology played a significant role in productivity increases and was a key driver of economic growth. Yasmeen & Tufail (2015) the impact of internet usage on economic growth with both capital and labor has positive impact on economic growth in Pakistan using ARDL panel in the long run. Brown, Bryson & Bankole. (2015) The impact on

ICT infrastructure on trade within Africa has present prosperous trade flows using SEM analysis that telecommunication infrastructure has crucial implications following by Educational attainment that indirectly influenced to Intra – African Trade.

Internet access and widespread use of new devices and digital payments have facilitated e-commerce in China, owing to the world's largest Internet population and an increase in the use of mobile payments. (Kinda, T, 2019). According to Google and Temasek, Indonesia with a highly appealing market for e-commerce, that spends 3.9 hours per person per day on the internet, more than the South-east Asian average of for about 3.6 hours per day, higher than the Chinese average. highlighting the market's resilience. (three hours per day), the US (two hours per day), the UK (1.8 hours per day) and Japan (one hour per day). An estimated 171.2m Indonesians, or almost two-thirds of the population, were internet users at the beginning of 2019, according to a survey by the Indonesian Internet Service Providers Association.

According to the e-Conomy South-east Asia 2019 study from Google, Singapore-based investment company Temasek, and consultant Bain, the region's e-commerce market grew at a rate of about 49 percent per year over the period to \$40 billion. The country's internet economy is projected to reach \$130 billion by 2025, driven by e-commerce, ride-hailing apps, and digital payment acceptance. Investment in the market crossed \$4 billion in both 2018 and 2019, with successful funding rounds held by local unicorns Bukalapak, Gojek, Tokopedia, and Traveloka.

According to a national survey conducted by the Indonesian Internet Providers Association (APJII), the internet penetration rate in Indonesia jumped by 14.6% from the previous year to 196 million, up from 171 million in 2018. Indonesia now has a 73.7 percent internet penetration rate, up from 64.8 percent in 2018. This indicates that the nation is directly competing to neighbors Brunei, Singapore, and Thailand, where internet penetration rates reached 70% last year. (Eloksari, A, 2020).

5. CONSLUSION

Technology and business are likely two faces of the coin side. Technology is constantly redefining business models, reinventing systems, evolving organizational environments, and strengthening consumer and supplier relationships. With the advent of computer technology, the World Wide Web has emerged as the main means of communication for the networked world. Via the Internet, computers in geographically distant locations can communicate with one another. E-commerce, according to most experts, has reshaped the corporate landscape. A small business with a higher quality product and improved customer service will take advantage of the massive growth of virtual communities from the producer to the consumer to compete with larger corporations (B, Ravi. 2017)

According to Chen & Kimura (2017) The challenges and benefits of the modern economy coexist. Asian countries, in particular, must prioritize (i) access, (ii) utilities, (iii) laws and regulations, and (iv) labor skills. Electronic commerce is altering firm business structures, affecting industry actor partnerships, and causing changes in market structure. Electronic commerce alters firms' competitive advantages as well as the essence of their competition. Since these processes are complex, the effect of electronic commerce will be firm, sector, and time specific. The ease of use of purchase systems in order to promote and enable the adoption of electronic commerce There is a lot of work being done to constantly redesign and revisit the process in order to make it as quick and easy for the clients as possible.

In conclusion that e-commerce in Indonesia has developed quite well over time. There are also many factors that can influence this development. Because of the results above, e-commerce in Indonesia is also quite influential in the short and long-run, although there are still many e-commerce indicators that have no significant effect on economic growth in Indonesia. E-commerce in Indonesia also plays a big role from an economic, social, and cultural point of view. Many things become easily with e-commerce, but of course, there are still some cities in Indonesia that are still e-commerce literate. Followed by data from BPS (2019) Of the recorded number, 72.83

percent of businesses sold goods/services via the internet in 2018, while 2.76 percent of businesses had no sales transactions via the internet in 2018, and the remaining 25, 11 percent of new businesses started selling goods/services via the internet in 2019. Most businesses started selling online from 2017 to 2018, amounting to 45.31 percent. As many as 70.89 percent of businesses reasoned that they were more comfortable selling directly (offline).

Gloria (2016) Despite the fact that the electronic commerce industry is growing, Danu admits that the growth of this industry in Indonesia is still hampered by numerous obstacles, such as merchandising, logistics or distribution of goods, and payments. This is one of the reasons why many Indonesians are still comfortable selling offline. As a result, he hopes that the government can engage more in assisting innovative industry players to increase output efficiency, as they are also one of the important pillars for the growth of the e-commerce industry. Botha, J, Bothma, C & Geldenhuys, P. (2008). Numerous developments in the rapidly evolving field of technology, especially electronic communication and internet technology, have created new opportunities for business and have had a significant impact on how business is conducted. In certain cases, new business models can now evolve, and existing models can be updated to better satisfy consumers and produce more revenue for the company.

The Organization for Economic Cooperation and Development (OECD) (1999) One of the primary factors for electronic commerce's rapid growth, especially in the business-to-business market, is the significant impact on costs associated with inventories, sales execution, sourcing, and delivery, as well as intangibles in banking. To fully profit from computers, businesses must be able to open up their internal infrastructure to suppliers and consumers. When firms' practices become more interconnected, concerns over security and possible anti-competitive effects emerge. E-commerce, in general, emphasizes differences that could arise between products, industries, and nations, highlighting the need to amend overlapping regulations.

Electronic commerce is reshaping the marketplace by altering firm corporate structures, influencing industry actor partnerships, and causing structural changes. Electronic commerce alters firms' competitive advantages as well as the essence of their competition. Since these processes are complex, the effect of electronic commerce will be firm, sector, and time specific. Any improvements in growth in the electronic marketplace will be dependent on the degree of confidence that businesses instill in their relationships with their business partners and customers. Privacy and personal information security guarantees are critical in fostering confidence. A better understanding of the requirements for fostering trust in electronic economies, especially among customers, is required for both the public and private sectors.

6. ACKNOWLEDGEMENT

I would like to acknowledge the inestimable help that my supervisor (Mr. Han Huichao) has given to help me finished my final thesis. Also, my family that always support me unconditionally through thick and thin. I would like to thank my friend in Indonesia for being source of inspiration. In addition, I would like to thank all of my generation that doing the thesis now, I hope the thesis that we wrote can be useful and inspired for anyone.

7. REFERENCES

Journal

- [1] Ang, P Internet Development in Asia. 2016, Internet Archive. Retrieved from https://web.archive.org/web/20160103054146/http://www.isoc.org/inet96/proceedings/h1/h1_1.htm
- [2] Anvari & Norouzi. The Impact of E-commerce and R&D on Economic Development in some selected Countries. 2016, DOI 10.1016/j.sbspro.2016.07.146

- [3] Astuti, P & Saputro, D. Kointegrasi dan Estimasi Error Correction Model (ECM)-Engle-Granger. 2018, ISSN: 2407-7496
- [4] B, Ravi. E-commerce: Problems and Prospect. 2017, Volume 8 issue. ISSN 2319 – 9202
- [5] Baytar, U. The Impact of E-commerce on Economic Growth: A Bibliometric Study. Global Business Research Symposium, Istanbul, Turkey, May 28-30, 2015, ISBN 978-1- 60530-529-5.
- [6] Brown, Bryson & Bankole. The Impact of Information and Communication Technology Infrastructure and Complementary Factors on Intra-African Trade. 2015, DOI: 10.1080/02681102.2013.832128
- [7] Damuri, Y, Negara, S & Azali, K. Indonesia's E-commerce: A New Engine of Growth?. 2015, Symposium on E-commerce. Singapore. Symposium on E-commerce, ASEAN Economic Integration, and Competition Policy & Law. 2017:2-5
- [8] Dholakia, P. Prospects of E-commerce and its future implications in India. 2015, Volume-2, Issue-2, February-2015. ISSN: 2349-7637.
- [9] Dickey, D & Fuller, W. Distribution of the Estimators for Autoregressive Time Series With a unit Root. Journal of the American Statistical Association, Volume 74, issue 366 (Jun., 1979), 427-431.
- [10] Elseoud, M. Electronic Commerce and Economic Growth in Saudi Arabia. United Kingdom. International Journal of Economics, Commerce and Management. 2014, Vol, II. Issue 5. ISSN 23448 0386.
- [11] Gupta, A. E-commerce: Role of E-commerce in Today's Business. India. International Journal of Computing and Corporate Research. 2014, Volume 4 issue 1 January. ISSN: 2249-054X.
- [12] Hamdan, D. Study of The Impact E-commerce on Malaysia's Economic Growth. 2020, ISSN: 2414-0309.
- [13] Liu, S. An Empirical Study on E-commerce effects on Economic Growth. Xiamen, China. International Conference on Education Technology and Management Science (ICETMS). 2013, Atlantis Press.
- [14] Lusta, A. The Impact Electronic Commerce on Libya's Economic Growth. USA. International Journal of Research in Commerce & Management. 2017, Volume No.8, Issues No. 04 (April). ISSN 0976-2183.
- [15] Ma'ruf, A & Wihastuti, L. Pertumbuhan Ekonomi Indonesia: Determinan and Prospeknya. Yogyakarta, Indonesia. Jurnal Ekonomi dan Studi Pembangunan. 2008, Volume 9, Nomor 1, April.
- [16] Nemat, R. Taking a look at different types of e-commerce. Cairo, Egypt. World Applied Programming (WAP). June 2011: 100-104, Vol (1), No (2). ISSN 2222-2510.
- [17] Qu, Lili and Chen, Yan, "The Impact of e-commerce on China's Economic Growth" (2014). WHICEB 2014 Proceedings. 101. <http://aisel.aisnet.org/whiceb2014/101>
- [18] Suhindarto, Andari & Aryani. Pengaruh Teknologi Informasi dan E-commerce terhadap Perdagangan Indonesia ke Negara ASEAN. 2020 : 53–66, Volume 9 Number 1. e-ISSN: 2721-222X
- [19] Syahputra, R. Analisis Faktor-Faktor yang mempengaruhi Pertumbuhan Ekonomi di Indonesia. JURNAL SAMUDRA EKONOMIKA, 2017, VOL. 1, NO. 2 OKTOBER.
- [20] Yasmien, R & Tufail, S. Impact of internet technology on Economic Growth in South Asia with special Reference to Pakistan. Pakistan Journal of Social Sciences (PJSS) Vol. 35, No. 2 (2015), pp. 777-784

Books

- [1] Becker, S. Electronic Commerce: Concepts, Methodologies, Tools, and Applications. United States of America. IGI Global. 2008:1-9 ISBN 978-1-59904-944-1

- [2] Borowy, I, & Schmezer, M. History of the future of Economic Growth: Historical roots of current debates on sustainable degrowth. Routledge. 2017: 1-27 ISBN: 978-1-315-54300-0.
- [3] Botha, J, Bothma, C & Geldenhuys, P. Managing E-commerce in Business (2nd ed.). Juta and Company Ltd. 2008: 1-14, ISBN 978-0-70217-304-2.
- [4] Clark, T & Westland, J. Global Electronic Commerce: Theory and Case Study. 2000, 1-15. The MIT Press. ISBN 0-262-23205-7.
- [5] Galindo, M, Guzman, J & Riberio, D. Entrepreneurship and Business. 2009, 1-27, Springer. e-ISBN: 978-3-540-70902-2.
- [6] Gujarati, D. Basic Econometrics (4th ed). McGraw-Hill Higher Education. 2003: 341,792 ISBN 978-0-07-233542-2.
- [7] Hil, H & Khan, M & Zhuang, J. (2013). Diagnosing the Indonesia Economy toward inclusive and green growth. London & Philippines, Anthem Press & Asia Development Bank.2013:1, ISBN-10: 1 78308 052 3.
- [8] Hudson, E. Economic Growth: How it works and how it transformed the world. Vernon Press. 2020: 474-500, ISBN 978-1-62273-972-1.
- [9] Jurriëns, E & Tapsell, R. Digital Indonesia: connectivity and divergence 2017: 1-34. ISEAS Publishing. ISBN 978-47-8600-3.
- [10] Laudon, K & Laudon, P. Management Information System. Pearson Education Limited 2014, 401, 420-426. ISBN 13: 978-0-273-78997-0.
- [11] Laudon, K & Traver, C. E-commerce Business technology society (13th ed). 2017: 203-2015. Pearson ISBN-13:978-0-13-460156-4.
- [12] Manzoor, A. E-commerce. Lambert Academic Publishing. 2010: 1-31, ISBN 978-3-8433-70-30.
- [13] Qin, Z. Introduction to E-commerce. Beijing and New York. Tsinghua University Pres and Spinger-Verlag GmbH Berlin Heidelberg. 2009:376-384 e ISBN 978-3-540-49645-8.
- [14] Taylor, G. Integrating Quantitative and Qualitative Methods in Research (2nd ed). United States of America. University Press of America. 2005:91-95 ISBN 0-7618-3241-6.
- [15] Todaro, M & Smith, S. Economic Development (11st ed). 2012, 65-70. Pearson ISBN 13: 978-0-13-801388-2.

Scientific Report

- [1] Apster. The Internet in Indonesia. Asia Pacific Network Information Centre (APNIC) Issue, 21 – February 2007: 1-8.
- [2] Badan Pusat Statistik (BPS). Statistik E-commerce 2019. Badan Pusat Statistik Indonesia. 2019:1-76. ISBN: 978-602-438-290-2.
- [3] Chen & Kimura. E-commerce as Asia's New Growth Engine. Economic Research Institute for ASEAN and East Asia (ERIA). No. 2017- 02, October 2017:1-4. ISSN: 2086-8154.
- [4] Ginting, E & Aji, P. Summary of Indonesia's Economic Analysis. Asian Development Bank (ADB) No.2 October 2015:1-9.
- [5] Google, Temasek and Bain, e-Conomy SEA 2020: At full velocity — Resilient and racing ahead, Indonesia, Nov. 2020:p9,p91.

- [6] Google, Temasek and Bain, e-Conomy SEA 2019: Swipe up and to the right: Southeast Asia's \$100 billion Internet economy, 2020:p4-65.
- [7] McKinsey & Company. The digital archipelago: How online commerce is driving Indonesia's economic development. August, 2018, p7-87.
- [8] OECD (1999-01-01), "Economic and Social Impact of Ecommerce: Preliminary Findings and Research Agenda", OECD Digital Economy Papers, No. 40, OECD Publishing, Paris. <http://dx.doi.org/10.1787/236588526334>.
- [9] Pesaran, M & Shin, Y. (1999). An Autoregressive Distributed- Lag Modelling approach to Cointegration Analysis. Strom, S (eds). Cambridge University Press. <https://doi.org/10.1017/CCOL521633230.011>.
- [10] The Commonwealth. E-commerce in Indonesia. Australian Trade and Investment Commission (Austrade). 17-18-003 Publication date January 2018.
- [11] The World Bank (2019). GDP per capita growth (annual %) – Indonesia. Retrieved from <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG?locations=ID>
- [12] The world Bank (2019). Individuals using the internet (% of population) – Indonesia. Retrieved from <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=ID>
- [13] The World Bank. (2020). The World Bank In Indonesia. Retrieve from <https://www.worldbank.org/en/country/indonesia/overview>
- [14] The World Bank (2020). Toward a secure and fast recovery. The Indonesia Economy Prospects (IEP). Retrieved from worldbank.org/iep
- [15] World Development Report. Enabling Digital Development: How the Internet Promotes Development, 2016. p42.

Bulletin Board

- [1] Audriene, D. Chairul Tanjung reminds two negative impact of e-commerce. Jakarta, Indonesia, CNN Indonesia, 2017. Retrieve from 23 January 2021. From <https://www.cnnindonesia.com/ekonomi/20170404132917-92-204829/chairul-tanjung-ingatkan-dua-dampak-negatif-e-commerce>
- [2] Bank Indonesia. Overview of the payment system in indonesia. Indonesia, Bank Indonesia, 2021. Retrieved 23 January 2021, from <https://www.bi.go.id/id/fungsi-utama/sistem-pembayaran/default.aspx>
- [3] Big Commerce. Ecommerce. Bigcommerce,2021. Retrieve 20 January 2021, from <https://www.bigcommerce.com/articles/ecommerce/>
- [4] Business.com. The 10 Largest E-commerce Markets in the World by Country. Waltham, MA, Business.com, 2020. Retrieved 1 February 2021, from <https://www.business.com/articles/10-of-the-largest-ecommerce-markets-in-the-world-b/>
- [5] Daniel, W. Wow! E-commerce Transactions Reach Rp 77T, Jump 151%. Indonesia, CNBC Indonesia. 2019. Retrieved 12 February 2021. from <https://www.cnbcindonesia.com/tech/20190311101823-37-59800/wow-transaksi-e-commerce-ri-2018-capai-rp-77-t-lompat-151mc>
- [6] Databoks. E-commerce Transaction value reaches IDR 266.3 trillion in 2020. Retrieved from <https://databoks.katadata.co.id/datapublish/2021/01/29/nilai-transaksi-e-commerce-mencapai-rp-2663-triliun-pada-2020>
- [7] Elok Sari, A. Indonesia internet users hit 196 million, still concentrated in java: APJII survey. Jakarta, Indonesia, The Jakarta Post, 2020. Retrieved 3 February 2021, from

<https://www.thejakartapost.com/news/2020/11/11/indonesian-internet-users-hit-196-million-still-concentrated-in-java-apjii-survey.html>

[8] Focus Economics. Economic Growth (GDP, annual variation in %). Barcelona, Spain. Focus Economics, 2021. Retrieved 3 February 2021, from <https://www.focus-economics.com/economic-indicator/gdp>

[9] Gloria (2016). Indonesia's E-commerce Penetration is still slow. Yogyakarta, Indonesia. Universitas Gadjah Mada, 4 November 2016. Retrieved 3 February 2021. from <https://www.ugm.ac.id/id/berita/12812-penetrasi-e-commerce-indonesia-masih-lambat>

[10] Hootsuite & We Are Social (2019), Digital 2019 Global Digital Overview," retrieved from <https://datareportal.com/reports/digital-2019-global-digital-overview>

[11] Hootsuite & We Are Social (2018), Digital 2018 Global Digital Overview," retrieved from <https://datareportal.com/reports/digital-2018-global-digital-overview>

[12] Hootsuite & We Are Social (2017), Digital 2017 Global Digital Overview," retrieved from <https://datareportal.com/reports/digital-2017-global-digital-overview>

[13] Kinda, T. (2019). E-commerce as a Potential New Engine For Growth In Asia. International Monetary Fund (IMF) Working Paper. WP/19/135

[14] iPrice (2021). Peta E-commerce Indonesia. Retrieved from <https://iprice.co.id/insights/mapofecommerce/>

[15] Lokadata (2017). Number of Internet users, 1998-2017. Retrieved from <https://lokadata.beritagar.id/chart/preview/jumlah-pengguna-internet-indonesia-1998-2017-1519030656#>

[16] Merchant Machine (2019). Saturated Sectors: Finding Gaps In the Ecommerce Market In 2021. Retrieved from <https://merchantmachine.co.uk/saturated-sectors/>

[17] Oxford Business Group (2021). E-commerce Opportunities In indonesia's retail market. Retrieved from <https://oxfordbusinessgroup.com/overview/delivered-success-market-dominated-brick-and-mortar-stores-e-commerce-proving-attractive-young-tech>

[18] ReportLinker (2021). The Indonesia freight and logistics market is expected to witness a CAGR of 10.27% during the forecast period (2020 – 2025). Retrieved from <https://www.globenewswire.com/news-release/2021/02/09/2171971/0/en/The-Indonesia-freight-and-logistics-market-is-expected-to-witness-a-CAGR-of-10-27-during-the-forecast-period-2020-2025.html>

[19] Tempo.co (2021). E-commerce dorong gaya hidup pembayaran digital. Retrieved from <https://bisnis.tempo.co/read/1274649/e-commerce-dorong-gaya-hidup-pembayaran-digital/full&view=ok>

[20] Yasmin, G. The Role of Logistics in the Advancement of E-commerce in Indonesia. 2019, Indonesia, Supply Chain Indonesia. Retrieve 25 January 2021 from <https://supplychainindonesia.com/peran-logistik-dalam-kemajuan-e-commerce-indonesia/>