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THE AUTOREGRESIVE DISTRIBUTION LAG (ARDL) MODEL TO APPROACH BILATERAL TRADE OF INDONESIA – CHINA

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ABSTRACT

The main objective of this research is to study the chances and obstacles of bilateral trade of China and Indonesia by using the Autoregressive Distribution Lag (ARDL) model approach. The time series data is used to estimate and evaluate empirical results based on annual data from 1987 to 2014. This is also to test the chances and obstacles of bilateral trade between Indonesia and China. The results show those market size and currency exchange rates are bilateral trade opportunities of Indonesia – China where the factors have significant influence in bilateral trade between Indonesia and China.

KEY WORDS

ARDL Model, Bilateral Indonesia-China, market, trade.

The growth slowed further from 7.3% in 2014 to 6.9% in 2015, continuing a trend since 2010 as the economy of the People's Republic of China (PRC) shifts further toward a new normal in which domestic consumption and services are the main engines of growth, with the government increasingly focused on growth quality over quantity. Despite growth moderation, the PRC has doubled its GDP since 2009 to reach \$10.8 trillion in 2015, thus continuing to account for about a third of global growth in 2015, which is almost the same as in 2010 when it is then smaller economy was growing by double digits (Nakao, 2016).

On the supply side, rebalancing progressed further toward growth driven by the service sector. Services contributed an estimated 3.7 percentage points to GDP growth, while industry contributed 2.8 points and agriculture 0.3 points. The share of services in nominal GDP increased to 50.5% (Figure 3.9.2). Financial services performed particularly strongly, growth of retail sales remained robust, and the hospitality sector stabilized after 2 lean years in which an anticorruption initiative limited scope for lavish entertainment. Within industry, consumer-oriented manufacturing outperformed heavy industry, which continued to suffer from excess capacity, spillover from an ailing housing sector, and lower commodity prices. Heavy industry was the main factor behind the decline in aggregate industrial profits by 2.3% in 2015 (Nakao, 2016).

On the demand side, consumption was the main growth engine, contributing 4.6 percentage points to GDP growth, up from 3.7 percentage in 2014. Investment contributed 2.5 percentage points, down from 3.4 in 2014, while the contribution of net exports turned negative. The continuing structural slowdown in investment growth was most pronounced in real estate, which suffers from a large housing overhang. The government cushioned the correction by removing purchase restrictions, improving access to mortgages, relaxing down-payment requirements, and accelerating public housing construction and shantytown redevelopment. Real estate sales grew in recent months and prices increased, even as unsold floor space kept rising (Nakao, 2016).

The GDP share of trade in goods and services has declined over the past decade, even as it has increased in most other Southeast Asian economies. Although Indonesia is a large producer of palm oil, coal, rubber, and coffee, its total exports are less than 2% of global trade in goods and services. This points to the tremendous potential that expanding trade has for boosting demand for Indonesian goods and services, provided that a firm commitment to openness and global competitiveness is maintained. The growing use of nontariff measures such as import and export restrictions, and of state interventions to stabilize domestic commodity markets, ultimately weakens external competitiveness and

should be reconsidered (Nakao, 2016).

Stronger growth is seen for ASEAN. Aggregate growth in the 10 ASEAN economies is forecast to accelerate steadily from 4.4% in 2015 to 4.5% in 2016 and 4.8% in 2017. Growth will be led by Indonesia as it ramps up investment in infrastructure and implements policy reform that spurs private investment. Solid consumption and investment will provide a lift to the Philippine economy. Thailand's recovery is expected to gather momentum, and Viet Nam will sustain vigorous expansion. In contrast, Malaysian growth will slip further with low oil prices and weak external demand (Nakao, 2016). Growth in developing Asia is forecast to dip slightly. Gross domestic product (GDP) in the region will expand by 5.7% in 2016 and 2017, decelerating from 5.9% in 2015 in a difficult and uncertain global environment. Solid growth in India and a pickup in aggregate growth in the Association of Southeast Asian Nations (ASEAN) will help balance continued growth moderation in the People's Republic of China (PRC). Despite the slight dip, the region will contribute around 60% of global growth in the next 2 years, close to its contribution in the past 5 years (Nakao, 2016).

Indonesia and China have long established bilateral trade relations as a comparison of economic research. This is not only the cause of the two countries which is very popular in the world, but also adopted the differences in the development model undertaken. New economists have recently been interested in comparing major developments to compare giant economic developments due to spectacular economic growth performance in recent years. Furthermore, their economic growth increases significantly from the economic and political side. The authors are interested in institutional arrangements, which are capable of influencing economic performance in both countries.

Figure 1 – Export-Import Activities of Indonesia – China

Figure 1 shows that Indonesia's exports to China are smaller than Chinese imports to Indonesia (Indonesian imports from China). This means that China, which has the world's largest population, is the market for Indonesian goods. In contrast, Indonesia's large GDP is a market for goods produced by China.

The purpose of this study is to examine the trend of bilateral trade between the two countries at this time and to apply future economic and trade cooperation between the two economies. This paper will add literature to the comparison of the two economies. Furthermore, it deals with economic analysis, to see the benefits in comparing bilateral trade co-operation between the two economic explorations.

This study uses time series data on bilateral relations between Indonesia and China, as well as to analyze bilateral trade opportunities and barriers. Opportunities and obstacles can be seen from the variables used such as market size and exchange rate.

THEORY AND HYPOTHESIS

Trade flows between countries depend on a number of factors. Bilateral trade flows between two countries are assumed to be proportional to the level of their GDP. The GDP takes into account the fact that higher income economies tend to be more interested in product differentiation and specialization, thus they trade more (Fujimura & Edmonds, 2006).

Smith made a strong case for free trade by his example of absolute advantages. However, one question continued to puzzle thinkers: What if a country does not have an absolute advantage? David Ricardo in 1817 proposed what is known as the theory of comparative advantages to explain how trade can benefit countries even if they do not have an absolute advantage (Bjornskov, 2005). Now, country A has an absolute advantage in producing both products. A worker takes two hours to produce a cell phone compared to four hours in country B, and eight hours to produce a tonne of potato chips compared to ten hours in country B. The puzzle was that according to the theory of absolute advantages, country A should specialize in both products. That would leave country B with no means to pay for imports from country A, which in turn would stop all trade between the two countries. However, Ricardo saw the possibility of arbitrage – that it would pay for a trader to buy a product in one country, sell it in the other country, use his profits to buy a product in that country and bring it home to his own country where he could sell what he bought in the other country with a profit (Bjornskov, 2005).

A country has an absolute advantage in producing a good over another country if it uses fewer resources to produce that good. Absolute advantage can be the result of a country's natural endowment. For example, extracting oil in Saudi Arabia is pretty much just a matter of "drilling a hole." Producing oil in other countries can require considerable exploration and costly technologies for drilling and extraction—if indeed they have any oil at all. The United States has some of the richest farmland in the world, making it easier to grow corn and wheat than in many other countries. Guatemala and Colombia have climates especially suited for growing coffee. Chile and Zambia have some of the world's richest copper mines. As some have argued, "geography is destiny." Chile will provide copper and Guatemala will produce coffee, and they will trade. When each country has a product others need and it can be produced with fewer resources in one country over another, then it is easy to imagine all parties benefitting from trade. However, thinking about trade just in terms of geography and absolute advantage is incomplete. Trade really occurs because of comparative advantage (Taylor et al., 2014).

Welcome to Economics! defined specialization as it applies to workers and firms. Specialization is also used to describe the occurrence when a country shifts resources to focus on producing a good that offers comparative advantage.) Similarly, if Saudi Arabia can trade an amount of oil less than 60 barrels and receive in exchange an amount of corn greater than 10 bushels, it will have more of both goods than it did before specialization and trade (Taylor et al., 2014).

The underlying reason why trade benefits both sides is rooted in the concept of opportunity cost, as the following Clear It Up feature explains. If Saudi Arabia wishes to expand domestic production of corn in a world without international trade, then based on its opportunity costs it must give up four barrels of oil for every one additional bushel of corn. If Saudi Arabia could find a way to give up less than four barrels of oil for an additional bushel of corn (or equivalently, to receive more than one bushel of corn for four barrels of oil), it would be better off (Taylor et al., 2014).

David Ricardo argued that if each country specializes in its comparative advantage, it will benefit from trade, and total global output will increase. How can we show gains from trade as a result of comparative advantage and specialization? shows the output assuming that each country specializes in its comparative advantage and produces no other good. This is 100% specialization. Specialization leads to an increase in total world production (Taylor et al., 2014).

In small open economies like Ghana, external trade is an integral component of the nation's growth and development agenda. Consequently, the promotion of foreign trade has

been central to all government policies since 1956. Akin to other developing economies, particularly in Africa, Ghana's exports are traditionally dominated by a few primary products, namely, cocoa, timber, and unprocessed mineral resources (gold, diamond, bauxite and manganese), whilst imports are dominated by capital goods (such as machinery, transport equipment, chemicals and other intermediate inputs), foodstuffs, and fuels. Owing to the persistent decline in foreign exchange earnings from the principal exports, mainly due to sectoral and market constraints (Buatsi, 2002), the non-traditional exports sector has been accorded an unparalleled attention in attaining economic growth and development since 1986. As part of the external sector reforms implemented under the Economic Recovery Program (ERP) and Structural Adjustment Policy (SAP), the trade restrictive, import-substitution development strategy of the 1960s and 1970s was gradually replaced by a more liberalized, outward oriented and export-led growth strategy, with serious governmental efforts towards diversifying and broadening Ghana's export base into non-traditional items like pineapples, yams, handicrafts, canned and smoked fish, processed foods, and wood products etc. The openness of Ghana's external sector, as measured by the share of export plus imports in GDP, has been rising since 1982 from 0.06 in 1982 to 0.46 in 1992, to 1.16 in 2000 and then to 0.703 in 2010. However, it has not succeeded in spurring exports growth over the growth in imports, leaving the balance of trade in deficits for most of the years between 1982 and 2010 (Bonuedi, 2013).

GDP is defined as the current value of all final goods and services produced in a nation in a year. What are final goods? They are goods at the furthest stage of production at the end of a year. Statisticians who calculate GDP must avoid the mistake of double counting, in which output is counted more than once as it travels through the stages of production. For example, imagine what would happen if government statisticians first counted the value of tires produced by a tire manufacturer, and then counted the value of a new truck sold by an automaker that contains those tires. In this example, the value of the tires would have been counted twice-because the price of the truck includes the value of the tires (Taylor et al., 2014).

Gross Domestic Product (GDP) is defined as the market value of all finished goods and services produced in a country during a certain period of time (Jochumzen, 2010).

Note that we only include finished goods and services – that is, anything that is sold directly to the consumer. Electric power sold to a steel mill is not included while all the electric power sold directly to consumers is included. The reason is simply that we want to avoid “double counting”. Consider for example the production of cars. Car producers have parts produced by other firms which in turn have parts delivered by other firms and so on. If we were to count the value of everything produced by a firm, then most parts of a car would be counted several times. This is why only the value of the finished car is used in the calculation of GDP. Note, however, that if a firm buys a robot that it uses in the production of cars, then this robot is counted (if it is produced in the same country). The car producer is then the “final consumer” of the robot – no value is added to it and it is not resold to another firm (Jochumzen, 2010).

GDP includes production that is exchanged in the market, but it does not cover production that is not exchanged in the market. For example, hiring someone to mow your lawn or clean your house is part of GDP, but doing these tasks yourself is not part of GDP. One remarkable change in the U.S. economy in recent decades is that, as of 1970, only about 42% of women participated in the paid labor force. By the second decade of the 2000s, nearly 60% of women participated in the paid labor force according to the Bureau of Labor Statistics. As women are now in the labor force, many of the services they used to produce in the non-market economy like food preparation and child care have shifted to some extent into the market economy, which makes the GDP appear larger even if more services are not actually being consumed (Taylor et al., 2014).

David Ricardo, another English economist, answered that question by his comparative advantage theory which states that “A nation, like a person, gains from trade by exporting the goods or services in which it has its greatest comparative advantage in productivity and importing those in which it has the least comparative advantage” (Lindert, 1991).

Subsequently, a model given by two Swedish economists Eli Hecksher and Bertil Ohlin had extended the D. Ricardo's theory and developed an influential theory of trade. Heckscher-Ohlin model is enhanced from the simple model of D. Ricardo by adding capital and land alongside labor and fundamental factors. As one of the leading theories about the determinants of trade pattern of a nation, Heckscher-Ohlin model predicts that a country will export products of which the production use abundant factors intensively and import products of which the production use scarce factors intensively (Binh, Duog, & Cuog, 2010).

To be able to make reasonable comparisons of GDP over time, we must adjust for inflation. For example, if prices are doubled over one year, then GDP will double even though exactly the same goods and services are produced as the year before. To eliminate the effect of inflation we divide GDP by a price index and we define real GDP as GDP divided by a price index (Jochumzen, 2010).

One of the closest cousins of GDP is the gross national product (GNP). GDP includes only what is produced within a country's borders. GNP adds what is produced by domestic businesses and labor abroad, and subtracts out any payments sent home to other countries by foreign labor and businesses located in the United States. In other words, GNP is based more on the production of citizens and firms of a country, wherever they are located, and GDP is based on what happens within the geographic boundaries of a certain country (Taylor et al., 2014).

It is not very common to use CPI in the construction of real GDP. The reason is that CPI measures the price evolution of consumer goods while GDP includes investment goods as well as consumer goods. Instead, it is common to use a GDP deflator as a price index. The GDP deflator measures the price evolution of a basket whose composition is close to the composition of GDP. The difference between the CPI and the GDP deflator is fairly small however. To avoid confusion, GDP that is not adjusted for inflation is often called nominal GDP (Jochumzen, 2010).

The size of a nation's overall economy is typically measured by its gross domestic product (GDP), which is the value of all final goods and services produced within a country in a given year. The measurement of GDP involves counting up the production of millions of different goods and services—smart phones, cars, music downloads, computers, steel, bananas, college educations, and all other new goods and services produced in the current year—and summing them into a total dollar value (Taylor et al., 2014).

The Macroeconomic Perspective explained how to measure GDP, the challenges of using GDP to compare standards of living, and the difficulty of confusing economic size with distribution. In China's case, for example, China ranks as the second largest global economy, second to only the United States, with Japan being third. But, when we take China's GDP of \$9.2 trillion and divide it by its population of 1.4 billion, then the per capita GDP is only \$6,900, which is significantly lower than that of Japan, at \$38,500, and that of the United States, at \$52,800. Measurement issues aside, it's worth repeating that the goal, then, is to not only increase GDP, but to strive toward increased GDP per capita to increase overall standards of living for individuals. As we have learned from Economic Growth, this can be achieved at the national level by designing policies that increase worker productivity, deepen capital, and advance technology.

GDP per capita also allows us to rank countries into high-, middle-, or low-income groups. Low-income countries are those with \$1,025 per capita GDP per year; middle-income countries have a per capita GDP between \$1,025 and \$12,475; while high-income countries have over \$12,475 per year per capita income (Taylor et al., 2014).

The U.S. economy has the largest GDP in the world, by a considerable amount. The United States is also a populous country; in fact, it is the third largest country by population in the world, although well behind China and India. So is the U.S. economy larger than other countries just because the United States has more people than most other countries, or because the U.S. economy is actually larger on a per-person basis? This question can be answered by calculating a country's GDP per capita; that is, the GDP divided by the population (Taylor et al., 2014).

GDP per capita = GDP/population

GDP has nothing to say about the level of inequality in society. GDP per capita is only an average. When GDP per capita rises by 5%, it could mean that GDP for everyone in the society has risen by 5%, or that of some groups has risen by more while that of others has risen by less—or even declined. GDP also has nothing in particular to say about the amount of variety available. If a family buys 100 loaves of bread in a year, GDP does not care whether they are all white bread, or whether the family can choose from wheat, rye, pumpernickel, and many others—it just looks at whether the total amount spent on bread is the same (Taylor et al., 2014).

Exchange rates eventually move to offset exactly national differences in inflation. If U.S. monetary growth leads to a long-run doubling of the U.S. price level, while Germany's price level remains constant, PPP predicts that the long-run DM price of the dollar will be halved. This nominal exchange rate change leaves the real exchange rate between the dollar and DM unchanged and thus maintains Germany's internal and external balance. In other words, the long-run exchange rate change predicted by PPP is exactly the change that insulates Germany from U.S. inflation. (Krugman & Obstfeld, 2003).

Thailand has the opposite movement in its bilateral trade to Japan: a real exchange rate devaluation shock initially improved then worsened and then improved the trade balance (Onafowora, 2003)

Real Bilateral Exchange Rate (RBER): The real bilateral exchange rate is real exchange rate between the Ghana Cedi and the currency of the trading partners. It is thus the price of the Ghana Cedi expressed in terms of the foreign currency of the each trading partner. (Bonuedi, 2013).

The issue gained greater prominence in the economic debate from the 1990s onwards, when sustained deviations of exchange rates from their equilibrium values were suspected, rightly or wrongly, to be at the origin of global current account imbalances. From a macroeconomic point of view, exchange changes can have strong effects on the economy, as they may affect the structure of output and investment, lead to inefficient allocation of domestic absorption and external trade, influence labour market and prices, and alter external accounts. Hence, exchange rate shifts affect international trade both in direct and indirect ways. The indirect links are hard to isolate macro-economically, complex to describe, and empirically hard to test, as they have second, third or fourth round effects. This is why exchange rates are often treated in models as external (exogenous) variables. (Auboin & Ruta, 2011).

The first aspect of the relationship between exchange rates and trade, relates to exchange rate volatility. The basic argument which, increase exchange rate volatility would result lower international trade is risks and transaction costs associated with variability in the exchange rate (Nicita, 2013: 2). On the theoretical side the relationship between higher exchange-rate volatility and international trade transactions have been conducted by Hooper and Kohlhagen (1978). (Lotfalipour & Bazargan, 2014).

Most countries have different currencies, but not all. Sometimes small economies use the currency of an economically larger neighbor. For example, Ecuador, El Salvador, and Panama have decided to dollarize—that is, to use the U.S. dollar as their currency. Sometimes nations share a common currency. A large-scale example of a common currency is the decision by 17 European nations—including some very large economies such as France, Germany, and Italy—to replace their former currencies with the euro. With these exceptions duly noted, most of the international economy takes place in a situation of multiple national currencies in which both people and firms need to convert from one currency to another when selling, buying, hiring, borrowing, traveling, or investing across national borders. The market in which people or firms use one currency to purchase another currency is called the foreign exchange market (Case, Fair, & Oster, 2012), (Taylor et al., 2014).

Exchange rates can sometimes change very swiftly. For example, in the United Kingdom the pound was worth \$2 in U.S. currency in spring 2008, but was worth only \$1.40 in U.S. currency six months later. For firms engaged in international buying, selling, lending,

and borrowing, these swings in exchange rates can have an enormous effect on profits. (Case et al., 2012), (Taylor et al., 2014).

An exchange rate is nothing more than a price—that is, the price of one currency in terms of another currency—and so they can be analyzed with the tools of supply and demand. The first module of this chapter begins with an overview of foreign exchange markets: their size, their main participants, and the vocabulary for discussing movements of exchange rates. The following module uses demand and supply graphs to analyze some of the main factors that cause shifts in exchange rates. A final module then brings the central bank and monetary policy back into the picture. Each country must decide whether to allow its exchange rate to be determined in the market, or have the central bank intervene in the exchange rate market. All the choices for exchange rate policy involve distinctive tradeoffs and risks. (Taylor et al., 2014) (Case et al., 2012).

In The International Trade and Capital Flows, for example, we discussed how exchange rates are used to compare GDP statistics from countries where GDP is measured in different currencies. These earlier examples, however, took the actual exchange rate as given, as if it were a fact of nature. In reality, the exchange rate is a price—the price of one currency expressed in terms of units of another currency. The key framework for analyzing prices, whether in this course, any other economics course, in public policy, or business examples, is the operation of supply and demand in markets (Case et al., 2012), (Taylor et al., 2014).

GDP_i (Gross Domestic Product) of Indonesia effect on bilateral trade of Indonesia-China. The increasing of Indonesia's GDP will affect the rise of bilateral trade between Indonesia and China. The results are supported by the research of (Bonuedi, 2013), (Raudonen & Freytag, 2012), (Dianniar, 2013), (Ghosh, 2003), (Martinez-Zarzoso & Nowak-Lehmann, 2003), (Hermawan, 2011), (Sohn & Yoon, 2001), (Kabir & Salim, 2010), (Zhang & Wang, 2015), (Effendi, 2014), (Binh et al., 2010), (Do, 2006), (Bahmani-Oskooee & Harvey (Khan, Khan, & Others, 2013), (Elshehawy, Shen, & Ahmed, 2014), (Sheriff & Herrera, 2017), (Bahmani-Oskooee, Harvey, & Hegerty, 2017) Fantazy, 2013), (Wang & Badman, 2007).

H₁: GDP_j (gross domestic product) of Indonesia exert effect on bilateral trade of Indonesia-China

GDP PER CAPITA_i, the increasing GDP per capita of Indonesia shows the increasing of purchasing power of Indonesian people, this increase has an effect on bilateral trade of Indonesia-China. The results showed that the research was supported by the research of: (Martinez-Zarzoso & Nowak-Lehmann, 2003), (Sohn & Yoon, 2001), (Sherif & Fantazy, 2013), (Wang & Badman, 2007) (Hunter & Markusen, 1988)

H₂: GDP PER CAPITA_i, of China exert effect on bilateral trade of Indonesia-China.

GDP PER CAPITA_j, increasing GDP per capita of China exert effect on bilateral trade of Indonesia-China. Increasing GDP per capita of China shows the increasing of purchasing power of Chinese people, this increase affects the bilateral trade of China. The results showed that they are supported by the research of: (Martinez-Zarzoso & Nowak-Lehmann, 2003), (Sohn & Yoon, 2001), (Sherif & Fantazy, 2013), (Wang & Badman, 2007) (Hunter & Markusen, 1988).

H₃: GDP PER CAPITA_j of China exert effect on bilateral trade of Indonesia-China.

EXCR_i (exchange rate) of IDR to USD effect on bilateral trade Indonesia-China. The ups and downs of the IDR against the USD rate, will affect Indonesia-China trade). If the exchange rate of IDR against the USD rises, then export to China increases, because the price of exported goods goes up, profit will rise. Conversely, imports from China will decline, as the price of imported goods increases, if it remains imported then the omzet of the importer goes down or loss. Research was conducted by research of: (Binh et al., 2010), (Bonuedi, 2013), (Bahmani-Oskooee & Harvey, 2017), (Wang & Badman, 2007).

H₄: EXCR_j (exchange rate) of China or Yuan against the USD exert effect on bilateral trade Indonesia China.

THEORETICAL FRAMEWORK

Theoretical framework that examines the effect of Indonesia's gross domestic product, China's gross domestic product, Indonesia's per capita income, China's per capita income, Exchange rate of Indonesia, exchange rate of China against bilateral trade Indonesia-China is presented in the following figure:

Where:

GDPi: Gross Domestic Product from Indonesia;
 GDPj: Gross Domestic Product from China;
 CAPI: Income Per Capita from Indonesia;
 CAPj: Income Per Capita from China;
 EXCRi: Exchange Rate from Indonesia;
 EXCRj: Exchange Rate from China.

Figure 2 – Theoretical Framework Research

METHODS OF RESEARCH

The object used in this study is the financial data of Indonesia and China from 1987 to 2014. The samples are selected by using purposive sampling method. The data in this study are secondary data in the form of international financial statistic reports obtained from the Central Bank of Indonesia.

Jarque–Bera (JB) Test of Normality.²⁰ The JB test of normality is an asymptotic, or large-sample, test. It is also based on the OLS residuals. This test first computes the skewness and kurtosis measures of the OLS residuals and uses the following test statistic:

$$JB = n \left[\frac{S^2}{6} + \frac{(K - 3)^2}{24} \right]$$

Where: n = sample size, S = skewness coefficient, and K = kurtosis coefficient. For a normally distributed variable, S = 0 and K = 3. Therefore, the JB test of normality is a test of the joint hypothesis that S and K are 0 and 3, respectively. In that case the value of the JB statistic is expected to be 0. (Gujarati, n.d.). Under the null hypothesis that the residuals are normally distributed, Jarque and Bera showed that asymptotically (i.e., in large samples) the JB statistic given in follows the chi-square distribution with 2 df. If the computed p value of

the JB statistic in an application is sufficiently low, which will happen if the value of the statistic is very different from 0, one can reject the hypothesis that the residuals are normally distributed (Gujarati, n.d.)

In regression analysis involving time series data, if the regression model includes not only the current but also the lagged (past) values of the explanatory variables (the X's), it is called a distributed-lag model. If the model includes one or more lagged values of the dependent variable among its explanatory variables, it is called an autoregressive model.

$$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + u_t$$

Represents a distributed-lag model, whereas $Y_t = \alpha + \beta X_t + \gamma Y_{t-1} + u_t$ is an example of an autoregressive model. The latter are also known as dynamic models since they portray the time path of the dependent variable in relation to its past value(s) (Gujarati, n.d.)

RESULTS OF STUDY

This data processing uses the Autoregressive Distribution Lag (ARDL) model (Gujarati, n.d.) which aims to determine the partial and simultaneous effect on bilateral trade between Indonesia and China. This model aims to know the significance of the market size of Indonesia and China market, the purchasing power of Indonesia and China, the exchange rate of rupiah (IDR) and Yuan against USD, affect the up and down bilateral trade between the two countries. In the implementation of the calculation using the program E-views 9.0. The starting point of the ARDL Model formulation is expressed as a function of the general specifications of Indonesian and Chinese trade. The main components of the model ARDL include market size and exchange rates of each country.

Figure 3 – Normality Test Result

The result of this study is shown in Table 1 and Table 2 below.

The first hypothesis (H1) state that the GDP_i have a positive influence on the bilateral trade of Indonesia-China.

The size of the market as a key factor for bilateral trade between Indonesia and China means that a large Indonesian market is a market of Chinese manufactured goods exported to Indonesia. The GDP represents the amount of people's purchasing power, which is indicated by the total production of all existing firms in Indonesia, where the company issues funds to purchase raw materials, labor payments to process production, payment of administrative staff, general staff and sales staff. This large market has a very large production scale, so Indonesia needs raw materials, processed products and finished goods that have not been produced in Indonesia, imported from China. The results show that the rise of Indonesia's GDP impacts on Indonesia's trade rise to China significantly at the 5 percent level in the first year and a year earlier. And two years before it was not significant.

The second hypothesis (H2), state that GDP_j, have a positive influence on the bilateral trade of Indonesia-China. Market size as a key factor for China's bilateral trade means that

China's large market is a market of Indonesian manufactured goods exported to China. Conversely goods produced in China are also exported to Indonesia, because these goods are not produced in Indonesia. The PDBj represents the amount of people's purchasing power, which is indicated by the total production of all existing firms in China, where the company issues funds to purchase raw materials, labor payments to process production, payment of administrative staff, general staff and sales staff. This huge market has a huge production scale, so China needs raw materials, in which processed and finished products that is not yet produced in China, imported from Indonesia. The results show that the national product rising of China on year (-1) may increase China's bilateral trade in Indonesia-China, but it is less significant. The decreasing national product of China on year (-2) may increase Indonesia-China's bilateral trade and it is significant.

Table 1 – Summary of Result of Testing Hypothesis

Hypothesis	Coefficient	t - Statistic	Prob	Information
H1: GDPi	(1) 4,20405 (-1) 1,609938 (-2) 1,457574	5,309588 2,843848 1,764195	0,0011 0,0249 0,1211	Take effect Take Effect No Effect
H2: GDPj	(1) 0,460533 (-1) 1,468132 (-2) -5,403143	3,564804 0,840542 3,369781	0,0092 0,4284 0,0119	Take effect No Effect Take Effect
H3: Per CAPITAi	(1) 0,242957 (-1) 0,553885	0,600729 1,363379	0,5668 0,2150	No Effect No effect
H4: Per CAPITAj	(1) 0,001429 (-1) -0,005533 (-2) -0,000621	0,82516 -3,435418 -3,551208	0,4363 0,0109 0,0093	No effect Take Effect Take Effect
H5: EXCRi	(1) 0,3969 (-1) 1,3672 (-2) -0,610035	0,953661 3,452588 -1,892523	0,3720 0,1003 0,0107	No Effect No Effect Take Effect
H6: EXCRj	(1) 7,3712 (-1) -6,934972 (-2) -5,729464	2,938535 -2,019055 -4,792536	0,0218 0,0832 0,0020	Take Effect Take Effect Take Effect
H10: Adj R ²	0,994078	-	-	-
F-Statistic	234, 1566	-	-	Take effect
Prob	0,000000	-	-	Take effect

Table 2 – Hypothesis Testing Result

-	Hypothesis	Information
H1	The rising GDP of Indonesia on year (1) and one year before (-1) can rising bilateral trade Indonesia China and significant Year (-2) is not significant	(1)And (-1) Accepted, (-2) Rejected
H2	The rising GDP of China on year (1) can rising bilateral trade Indonesia China and significant. The rising GDP of China one year before (-1) can rising bilateral trade of Indonesia China and is not significant. The decreasing GDP of China two year before (-2) can rising bilateral trade of Indonesia China and significant.	(1)Accepted (-1) Reject. (-2) Accepted
H3	The rising per capita income of Indonesia can rising bilateral trade of Indonesia China and is not significant on year (1) and one year before (-1).	Reject
H4	The increasing per capita income of China can rising bilateral trade of Indonesia China and is not significant (1).. Year (-1) and (-2) decreasing of income per capita can rising Indonesia-China's bilateral trade is significant	Reject (1) Accepted (-1) and (-2)
H5	The rising exchange rate of IDR of Indonesia will increase bilateral trade of Indonesia China and is not significant on year (1) and (-1).The decreasing exchange rate of Indonesia will increase bilateral trade of Indonesia China on two year before (-2) and is significant	Reject on (1) and (-1). Accepted on (-2)
H6	The rising exchange rate of Yuan of China will increase bilateral trade of Indonesia China and significant on year (1). The decreasing exchange rate of Yuan of China will increase bilateral trade of Indonesia China and significant one year before (-1)and two years before (-2).	Accepted (1) (-1) and (-2)

The third hypothesis (H3), state that PER CAPITAi, income per capita is a measure of purchasing power per individual. Because if per capita income is high, then the purchasing power of demand for goods and services is very strong. Conversely, if per capita income is

low, then the purchasing power of demand for goods and services is less strong. The result of the research shows that positive beta coefficient means that the increase of per capita income of Indonesia influences the increasing of bilateral trade of Indonesia- China, although its influence is less significant both in the first year, one year before, and two years before.

The fourth hypothesis (H4), PER CAPITA_j, per capita income is a measure of purchasing power per individual. If per capita income is of high value, then the purchasing power of the society towards the demand for goods and services is very strong. Conversely, if per capita income is low, demand for goods and services is less strong. The results show a positive beta coefficient which means that China's per capita income increase affects the increasing bilateral trade of Indonesia-China, although its influence is less significant in the year of one(1). A year before, and two years earlier has a significant influence.

The fifth hypothesis (H5), state that EXCR_i, the USD exchange rate against USD, if the IDR exchange rate against USD is low, then the price of imported raw materials is low, so that the goods produced domestically and sold are low. On the other hand, if the IDR exchange rate against USD is high, then the price of imported raw material becomes high, plus the domestic production cost, the selling price is high, so the competition will be tighter both in domestic market and international market, or sales volume will decrease. The results show that the rise of the USD exchange rate against the USD has an effect on the rise of bilateral trade in Indonesia-China, although its influence is less significant in (1) and a year earlier 1). However, in the previous two years (-2) the exchange rate of USD against USD has decreased so that the effect on the bilateral trade increase significantly.

The sixth hypothesis (H6), EXCR_j states that the Yuan exchange rate against USD is low, the price of imported raw materials becomes low in value, so that the goods produced and sold are low. But if the exchange rate of Yuan against USD is high, then the price of imported raw material becomes high, plus the domestic production cost, then the selling price is also high, so the competition in the market gets tighter, or the sales volume will decrease. The results showed that the rise of the Yuan exchange rate against the USD increased the bilateral trade of Indonesia-China, because with different economic management with Indonesia, then the price of Chinese production goods in the world market is still relatively low. and significant in year (1). A year earlier (-1), and two years earlier (-2) Yuan exchange rate against USD decreased so that its influence on bilateral trade of Indonesia-China is quite significant.

CONCLUSION

H₁: The rising of Indonesia GDP_i impacts on Indonesia's export increase to China significantly at 5 percent level in the first year and a year earlier. And two years before it was not significant. This research is supported by research from: (Bonuedi, 2013), (Dainiar, 2013), (Ghosh, 2003), (Martinez-Zarzoso & Nowak-Lehmann, 2003), (Hermawan, 2011) (Sohn & Yoon, 2001), (Kabir & Salim, 2010), (Zhang & Wang, 2015), (Effendi, 2014), (Binh et al., 2010), (Do, 2006), (Bahmani-Oskooee & Harvey, 2017),

H₂: The national rising product of China on year (1) may increase Indonesia-China's bilateral trade and it is significant. The rising product of China on year (-1) can increase bilateral trade of Indonesia-China and it was not significant. The decreasing national product of China on year (-2) may increase Indonesia-China's bilateral trade and it was significant. The research is supported by: (Raudonen & Freytag, 2012), (Bahmani-Oskooee et al., 2017), (Gómez-Herrera, 2012), (Elshehawy et al., 2014), (Sherif & Fantazy, 2013), (Wang & Badman, 2007).

H₃: The rising income per capita of Indonesia can increase bilateral trade of Indonesia-China and it is not significant (1) and (-1). This research is supported by research from: (Martinez-Zarzoso & Nowak-Lehmann, 2003), (Khan et al., 2013),

H₄: The increasing income per capita of China can increase bilateral trade of Indonesia-China and it is not significant (1). Year (-1) and (-2) decreasing of income per capita can increase bilateral trade of Indonesia-China which was significant. This research is

supported by the research from: (Sherif & Fantazy, 2013), (Wang & Badman, 2007), (Hunter & Markusen, 1988).

H₅: The rising exchange rate of IDR of Indonesia will increase bilateral trade of China and it is not significant on year (1) and (-1). The decreasing exchange rate of Indonesia will increase bilateral trade of Indonesia China and it was significant on year -2). This research is supported by the research from: (Binh et al., 2010), (Bahmani-Oskooee & Harvey, 2017),

H₆: The exchange rate rising of Yuan, China will increase bilateral trade of China and it is significant on year (1). The exchange rate decreasing of Yuan, China will increase bilateral trade of China and it is significant on year (-1) and (-2). This research is supported by the research from: (Bonuedi, 2013), (Wang & Badman, 2007).

RECOMMENDATIONS

The role of the Government of Indonesia and private companies in terms of strengthening the trade relations with the Chinese government.

The role of the Indonesian government in fostering an increase in labor productivity in order to lower production costs and prices can compete in the international market.

The role of the Indonesian government in bureaucracy reform is mainly in the trade, ports sector so that time and cost can be more efficiently suppressed.

The role of the Indonesian government in terms of tax incentives, export credits to encourage the increase of exports.

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