



China's Economic Spillover to ASEAN-6 Economies: Before and After Renminbi Internationalization

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Abstract: In recent years, China becomes the second-largest economy in the world. Therefore, China has an important role in the Asia and Global Economy. China's rapid economic growth is why the Renminbi (China currency) becomes an international currency. In October 2016, the International Monetary Fund (IMF) recognized Renminbi as an international currency by including it in the global reserve currency (Special Drawing Right). Furthermore, Renminbi is in the top 10 traded currencies in the world, even in Asia. In global trade, China has trade relation with various countries, so it can benefit countries with economic relations with China, especially countries in Southeast Asia, which is a member of the ASEAN-China Free Trade Area (ACFTA). The purpose of Renminbi Internationalization is to increase China's economic growth and spillover from China to ASEAN. China's economic spillover to ASEAN has been growing in the few past years through financial linkage and trade linkage. This paper examines China's economics spillover to ASEAN-6 (Singapore, Malaysia, Thailand, Philippines, Indonesia and Laos) before and after Renminbi internationalization through trade and financial linkage. We use the ratio of ASEAN-6's exports and imports to China to its total exports and imports as a proxy of trade linkage and ASEAN-6's Stock Price Index as a proxy of financial linkage. In contrast, we use the claim and share of Renminbi in global foreign exchange reserve as a moderator variable to find out whether the Renminbi internationalization can strengthen China's economic spillover to ASEAN-6 or not. Thus, we use Moderated Regression Analysis and Panel Least Square method in 6 ASEAN countries from 2012:Q1-2018:Q4. The result indicates that Renminbi Internationalization can strengthen China's economic spillover to ASEAN-6 economies that can be seen through trade linkage with an increase in imports and through financial linkage with an increase in Stock Price Index. The findings imply that China can be a good prospect for the growth of emerging market countries in Asia; policymakers must pay attention to the spillover from China or the US economy.

Keywords: *Renminbi internationalization, trade linkage, financial linkage, stock price index, economic spillover*

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INTRODUCTION

The China economy is experiencing rapid development in recent years, this can be seen from China's Gross Domestic Product in 2018 reaching 13.457.27 billion dollars (Figure 1). Because of this, China become the second largest economy in the world. Furthermore, China's economic development can be seen from trade relations with other countries, especially with emerging market countries. According to [World Trade Organization \(2017\)](#), China is the

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largest exporter in the world, especially in ASEAN countries and contributes a quarter of global economic growth. Although China's GDP continues to rise, but China's GDP growth is slowing due to shift in demand, which shifted from the industrial sector to the service sector and there is also a shift from investment to consumption. However, China's GDP is above international standards set by G20 and China's investment level is higher among other countries (Organisation for Economic Co-operation and Development (OECD), 2019).

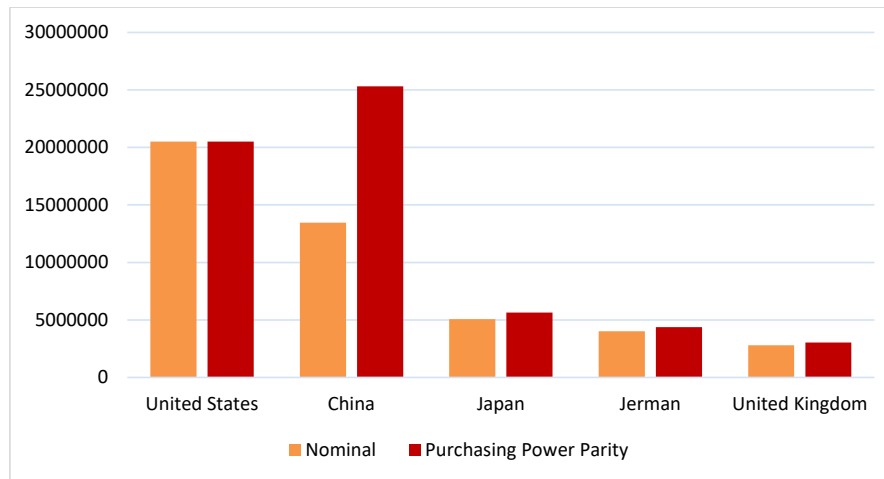


Figure 1 *GDP Indicator 2018 (Billion USD)*

The China's government is trying to turn the China's currency (Renminbi) into an international currency. The Renminbi internationalization effort began in July 2005 when renminbi exchange rate reform. China abandoned the fixed exchange rate regime and moved to manage floating exchange rate regime to support Cross-border Trade and Investment. On the other hand, Renminbi internationalization is supported through the development of the Renminbi offshore market (Shu, He, & Cheng, 2015), and implementation of Belt and Road Initiative (BRI) in 2013 which aims to increase trade and economic growth in Asia in order to compete with Africa and Europe. These two factors make the Renminbi have an influence on Asian currencies (Shu et al., 2015). Central banks in Asia consider the Renminbi included in their "currency basket". According to Kenen as cited in (Jayakarya, 2014) a currency is considered as an international currency, if the currency is used and stored outside the country's territorial borders which means that the currency is accepted and used as a payment instrument between countries. There are three dimensions of international currency, namely unit of account, medium of exchange (settlement), and store of value. If used in the private sector, international currencies function as trade invoices, such as facilitating trade transactions (exports and imports). In general, export and import transactions between two countries use third party currencies (international currencies) such as the US dollar. Currently, China uses Renminbi in export and import transactions with trading partners such as Singapore, Malaysia and Thailand. Otherwise, if used in the government sector, international currencies function as a foreign currency value measurement tool (exchange rate system).

This paper examines China's economic spillover on the economy of a country that has relations (Trade relation and Financial relation) with China, such as Singapore, Malaysia, Lao PDR, Philippines, Indonesia, and Thailand before and after Renminbi internationalization. China made several efforts such as "Go Global" which aims to make Renminbi is often used in international transaction such as cross-border trade and direct investment (Subacchi, Huang, & House, 2012). China's economic spillover through China's trade and financial relations with other countries has been widely studied by other researchers. Xu (2017) argues that China contributes to other countries economy through trade relations and financial relations. However, China's financial relations with other countries are not as big as China's role and contribution with other countries through trade relations.

This study found that trade and financial linkage and the internationalization of the Renminbi strengthened China's economic spillover of the economy in ASEAN-6. Drummond and Liu (2015) find that China's economic spillover positively affect other countries, when China's investment growth toward Africa's exports increased, economic growth in Africa also increased. Meanwhile, Furceri, Jalles, and Zdzienicka (2017) also found that China's economic spillover to Asia and emerging market economies is the biggest spillover. The ratio of ASEAN-6 exports to China and imports from China to ASEAN-6 economic growth has a positive impact.

LITERATURE REVIEW

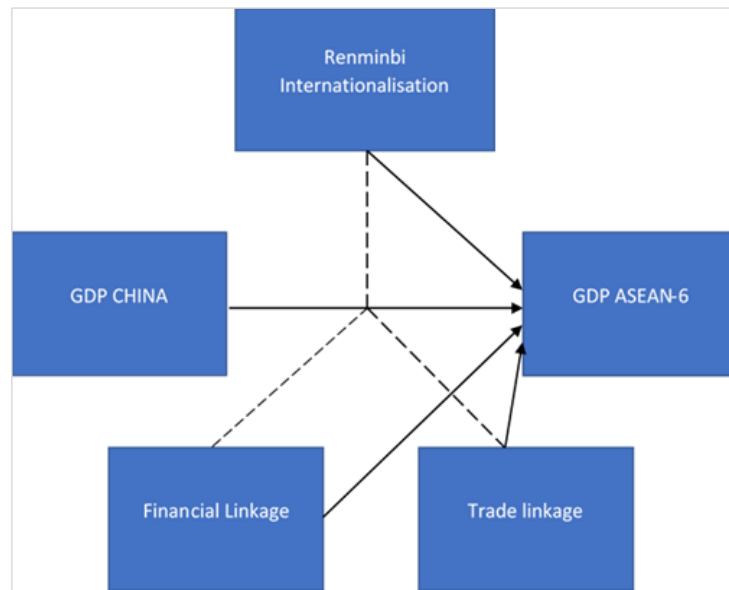


Figure 2 *Conceptual Framework*

Based on the conceptual framework (Figure 2), China's rapid economic growth makes China one of the largest economies in the world and increased trade relation and China's economic activity in the world (World Trade Organization, 2017). Therefore, China has an important role in the World Economy (World Trade Organization, 2017). Various Countries are affected by economic spillover from China, especially emerging market countries such as Southeast Asia (Furceri et al., 2017). Spillover is the externality of economic activity or the process of influencing variables that are not directly involved. In other words, spillover refers to unrelated events in a country can have an impact on other countries economy. China's economic spillover to Asean-6 economies can be seen through trade linkage and financial linkage. Xu (2017) and Furceri et al. (2017) find that trade linkage is the main transmission in China's economic spillover towards other countries. The Contribution of China's economic spillover to ASEAN was strengthened by Renminbi Internationalization (Xu, 2017). China is trying to make its currency into international currency, given that China's economic spillover through financial linkage is still low (Xu, 2017). Thus, this research aims to find out whether trade or financial linkage that can affect and strengthen China's spillover to the ASEAN-6 economies which is also strengthened by renminbi internationalization.

Economic Spillover

Economic Spillovers are the main factor that establish the global economy and the risk, but the effect is often changing (International Monetary Fund, 2016). China's economic spillover have increased trend since in the mid-1990s. The reason China's economic spillovers affect other economies is because China has an important role on the world Economy. Many countries have economic relations with China, especially ASEAN, these relations can be in the form of trade relations or financial relations. As China's economic became a larger, there will be a greater spillover to other economies (International Monetary Fund, 2016). Several studies show that trade channels are a key factor of economic spillovers from China (Furceri et al., 2017; Xu, 2017).

Renminbi Internationalization

The process to make Renminbi as international currency has begun since China change their exchange rate regime in July 2005 from fixed exchange rate regime to managed float exchange rate regime. Many exchange rates pegged to the us dollar. However, various countries in Asia have pegged their exchange rate to the international currencies which has entered into the global reserve currency. Since the change in the China's exchange rate regime, there is a decline in the influence of the US Dollar on exchange rates in several countries, especially in ASEAN. According to Henning (2013), there is a downward trend in the weight of the US Dollar and an increase in the Renminbi weight against the exchange rate in East Asian countries when China changed their exchange rate regime. Furthermore, the four large

countries with the largest economies in Southeast Asia have formed “renminbi bloc” with China, but Indonesia and Taiwan are increasingly pegged their exchange rate against US Dollar. On October 2016, Renminbi entered into global reserve currency which means that Renminbi is recognized as an international currency. Other evidence indicated by [Shu et al. \(2015\)](#) which shows that the offshore market (CNH) can affect currencies in the Asia-Pacific, where shocks to the China’s exchange rate can directly affect Asian Currencies (both onshore and offshore market). The impact of China’s exchange rate policy shocks may arise for two reasons. First, the renminbi is one of the basket components implicitly tracked by the Asian central bank. Second, international investors view the renminbi as the main currency in the region.

According to the Bank for International Settlement ([Kenen, 2009](#)), a national currency can be regarded as an international currency if most of the following conditions hold. First, the government must remove all restriction on the freedom of any entity, domestic or foreign, to buy or sell its country’s currency, whether in the spot or forward market. Second, Domestic companies can conduct export transactions with their currencies, as well as foreign companies must carry out transactions with the country’s currency. Third, Foreign companies, financial institutions, governments, and individuals are allowed to hold the country’s currency in the exchange rate basket. Fourth, foreign firms, financial institutions, including official institutions, are able to issue marketable instruments in the country’s currency. Fifth, the issuing country’s own financial institutions and non-financial firms are able to issue on foreign markets instruments denominated in their country’s own currency. Sixth, international financial institutions, such as the World Bank and regional development banks, are able to issue debt instruments in a country’s market and to use its currency in their financial operations. Seventh, the currency may be included in the “currency baskets” of other countries, which they use in governing their own exchange rate policies.

On the medium exchange (settlement) dimension, international currencies function as transactions and finance in the form of settlements used in the private sector. In addition, the Currencies internationalization requires a swap agreement between the central banks of other countries. The swap agreement aims to provide international currency liquidity to facilitate payment of trade between countries. Since 2009, China has made swap agreements with several countries in the world amounting to 3 trillion Yuan. In 2009, China entered into a bilateral swap agreement with Indonesia amounting to 100 billion yuan. Then, in 2010 with Singapore amounted to 300 billion yuan, and in the following year a bilateral swap agreement with Thailand amounted to 70 billion yuan.

International currencies can also be used as official international payments such as providing foreign assistance to other countries by denominating their currency to countries that are in needs of assistance. China provides foreign currency-denominated aid to countries in Africa. The international currency in the store of value dimension serves as a foreign exchange reserve for other countries. Some countries in Southeast Asia such as Singapore, Malaysia and Thailand have kept the Renminbi in the country’s foreign exchange reserves. In the private sector, international currencies in this dimension function as cross-border deposit and securities, which means that international currencies can be used in cash or deposit.

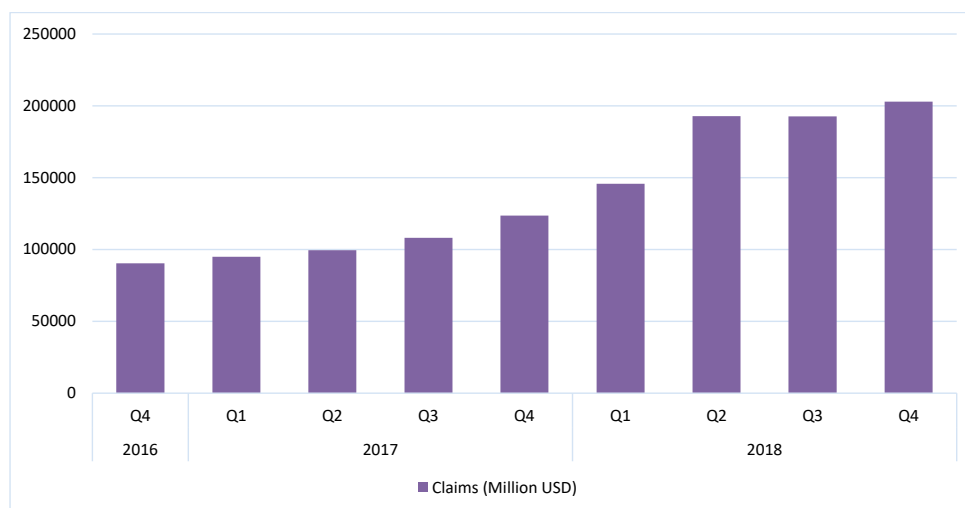


Figure 3 *Claims Renminbi in Composition Foreign Exchange Reserve* (Source: International Monetary Fund)

Based on [Daohua \(2015\)](#), [Yao and Pang \(2015\)](#), and [Zhang \(2015\)](#) research, it can be concluded that the efforts of the China's government to make the Renminbi an international currency through two main approaches, namely the Renminbi settlement in cross-border trade and investment and construction of offshore markets. Based on IMF data, the composition of the Renminbi currency in the foreign exchange reserve continues to increase as seen from claims from 2016:Q4 of 90,287.85 US dollars to 202,869.19 US dollars in 2018:Q4. In addition, the Renminbi share also continued to increase from 1.07 in 2016: Q4 and 1.89 in 2018:Q4. Claims and Renminbi share in the composition of world currencies in the foreign exchange reserve are higher than those of the Swiss francs.

Trade Linkage

In 2010, the average tariff reduction for goods exported to ASEAN from 12.8 percent to 0.6 percent in the ACFTA was enacted. The decline in export tariffs has made ACFTA the largest free trade area in the world covering 1.9 billion people and [Miler \(2015\)](#) found ACFTA to be the third largest nominal GDP after NAFTA. [Xu \(2017\)](#) found that ASEAN exports to China through trade linkage significantly affected the economy in ASEAN even though its influence was still dominated by other countries such as the US and Japan. Exports from every country in ASEAN-6 are different.

The increase in the ratio of ASEAN exports to China was caused by an increase in service imports from China. Based on research [Guajardo and Rönnqvist \(2016\)](#), China is in a transition period from investment to consumption, especially services. Therefore, it will be very beneficial for countries that have services and tourist attractions with visa regulations that are facilitated, low cost. This can encourage the country's economy through providing tourism attraction such as Singapore and Thailand.

Financial Linkage

The ratio of China investment to GDP in ASEAN-6 is below 1 percent except Singapore. [Ahuja and Nabar \(2012\)](#) found that China investment in Singapore was very large due to bilateral relations between China and Singapore. Therefore, China's economic spillover towards ASEAN can also be seen through financial linkage. Variations in the China's stock market have an influence on the global financial linkage ([Xu, 2017](#)). Therefore, this study wants to see the impact of volatility on the China stock market (Shanghai Stock Exchange Composite Index) on stock market volatility in ASEAN-6.

DATA AND METHODOLOGY

This study aims to find the China's economic spillover to economies in Singapore, Malaysia, Thailand, Indonesia, the Philippines and Laos (ASEAN-6) through trade linkage and financial linkage, especially after the internationalization of the Renminbi. The variables used to reflect the China's economy and the ASEAN-6 economy are the Nominal Gross Domestic Product of China and ASEAN-6, while the ratio of ASEAN-6's exports to China and imports from China to its total exports and imports as a proxy of trade linkage and Stock Exchange Composite Index ASEAN-6 and China as a proxy of financial linkage. Meanwhile, Renminbi internationalizations reflected through the claims of Renminbi in composition of foreign exchange reserves. This study uses Moderated Regression Analysis method to see the trade linkage, financial linkage and internationalization of the Renminbi can strengthen the china's economic spillover of the ASEAN-6 economy. In the Moderated Regression Analysis, the ratio of exports to China to total exports of ASEAN-6, the ratio of imports from China to total imports of ASEAN-6 and IHSG ASEAN-6 and the Renminbi claim as a moderating variable which means trade linkage, financial, and internationalization of the Renminbi can strengthen or weaken China's economic spillover to ASEAN-6 economy. Panel Least Square method to combine elements of cross-section and time-series is use for this study.

The data used in this study is a secondary data type. The data in this study were sourced from [CEIC Data \(2019\)](#), [International Monetary Fund \(2019\)](#), [Trading Economics \(2019\)](#), [World Integrated Trade Solution \(2019\)](#), and [UN Comtrade \(2016\)](#). The type of data used is quarterly panel data calculated from 2012:Q1 to 2018:Q4.

Table 1 DATA DESCRIPTION

No	Variable	Definition of Data	Units	Source
1	LOG_GDP ASEAN-6	ASEAN-6 GDP is the total market value of all goods and services produced within the borders of a country in each ASEAN-6 within a certain period of time.	Percent	CEIC Data (2019)
2	LOG_GDP China	China's GDP is the total market value of all goods and services produced within the borders of a country in China over a certain period of time	Percent	CEIC Data (2019)
3	Ratio of ASEAN-6's exports to China to its total exports	The proportion of exports to China from each country in ASEAN-6.	Decimal	World Integrated Trade Solution (2019) and UN Comtrade (2016)
4	Ratio of ASEAN-6's imports from China to its total imports	The proportion of imports from China from each country in ASEAN-6.	Decimal	World Integrated Trade Solution (2019) and UN Comtrade (2016)
5	IHSG ASEAN-6	The Stock Price Index is an index that measures the movement of all shares listed on the respective ASEAN-6 stock market	SGD, MYR, THB, IDR, PHP and LAK	Trading Economics (2019)
6	IHSG China	The Stock Price Index is an index that measures the movement of all shares listed on the China stock market (Shanghai Stock Exchange Composite Index).	Yuan	Trading Economics (2019)
7	Claim	Claim of Renminbi in composition foreign exchange reserves	million Dollar	International Monetary Fund (2019)

Panel Least Square

Panel data regression analysis is a regression analysis with panel data structure. In general, the estimation of parameters in the regression analysis with cross-section data is performed to use the estimation of the least square method or Ordinary Least Square. Therefore, panel data regression is a combination of cross-section and time-series data, where the same cross-section units are measured at different times. In other words, panel data is data from several individuals that were observed in a certain period of time. The cross-section element is indicated by n number of individuals ($i = 1, 2, 3, \dots, n$) and the time series element is indicated by t time period ($t = 1, 2, 3, \dots, t$). Thus, the equation in the panel regression data model is as follows:

$$Y_{it} = \alpha_{0it} + \beta_{1it}X_{1it} + \beta_{2it}X_{2it} + \dots + \beta_{nit}X_{nit} + \varepsilon_{it}$$

α_{0it} : Constant

X_{1it} : Observation i

ε_{it} : Error term

i : Number of individual (cross-section)

t : Time period (time-series)

In this study, the equation is estimated in the following form:

a. Before Renminbi internationalization:

$$\text{LOG}(\text{GDPASEAN}_6)_{it} = \beta_{0it} + \beta_{1it}\text{LOG}(\text{GDPCHINA})_{it} + \beta_{2it}\text{EXPORT}_{it} + \beta_{3it}\text{IMPORT}_{it} + \beta_{4it}\text{IHSG}_{it} + \varepsilon_{it}$$

b. After Renminbi internationalization:

$$\begin{aligned} \text{LOG}(\text{GDPASEAN}_6)_{it} &= \beta_{0it} + \beta_{1it}\text{LOG}(\text{GDPCHINA})_{it} + \beta_{2it}\text{EXPORT}_{it} + \beta_{3it}\text{IMPORT}_{it} \\ &+ \beta_{4it}\text{IHSG}_{it} + \beta_{5it}\text{CLAIM}_{it} + \varepsilon_{it} \end{aligned}$$

Panel data regression method will provide the results of the estimation that is the Best Linear Unbiased Estimation (BLUE) if all Gauss Markov assumptions are hold including, non-autocorrelation. There are several advantages to using panel data regression, it can provide a large number of observations, increasing the degree of freedom, the data have a large variability and reduce collinearity between explanatory variables so it can produce an efficient econometric estimation.

There are three estimation models in the panel data regression estimation model, namely Common Effect Model, Fixed Effect Model and Random Effect Model. The Common Effect Model is a very simple panel data model that combines cross-section and time-series data. Unlike Fixed Effect Model, it assumes that differences between individuals can be accommodated from differences in their intercepts. Therefore, to capture the intercept differences the method used is the dummy variable technique. Meanwhile, the Random Effect Model estimates panel data where interruption variables may be interconnected between time and between individuals. Unlike the Fixed Effect Model, the Random Effect Model error terms of each cross-section accommodate intercept differences. In addition, using the Random Effect Model has the advantage of eliminating the problem of heteroscedasticity.

Regression Analysis

Moderated Regression Analysis is a special application of linear multiple regression with the regression equation containing the element of interaction between the independent variable and the moderating variable. The interaction element is carried out by multiplying the independent variables and moderating variables. These interactions are also called moderate variables. The moderating variable can influence the direct relationship between the independent variable and the dependent variable (Liana, 2009). Therefore, moderating variables function to strengthen or weaken the relationship between the independent variable and the dependent variable.

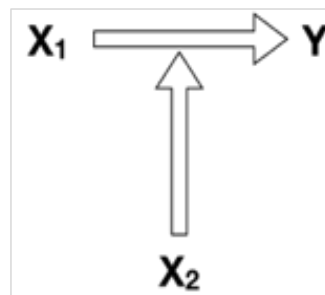


Figure 4 Moderated Regression Analysis (Source: Liana (2009))

Based on Figure 4 moderated regression analysis can be formulated in the following form:

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_1X_2 + \varepsilon$$

Y : Dependent variable

X_1 : Independent variable

X_2 : Moderation variable

X_3 : Moderate variable (interaction independent variable and moderation variable)

The variable X_1 is an independent variable and Y is the dependent variable. Meanwhile, X_2 is a moderating variable that can strengthen or weaken the relationship between the independent variable (X_1) and the dependent variable (Y). Therefore, the beta coefficient 3 must be significant at the determined alpha level. If the variables X_1 and X_2 are getting higher, then the relationship of the independent variable (X_1) is increase influence on the dependent variable (Y).

In this study, we want to see how China's economic spillover can affect economy in ASEAN-6 through trade linkage and financial linkage, especially after the Renminbi internationalization. Therefore, in this study there are two moderated models to see the China's economic spillover to economy in ASEAN-6 through trade linkage and financial linkage, as follows,

a. Trade linkage (Equation 1):

$$\begin{aligned} \text{LOG}(GDP_{ASEAN-6})_{it} &= \beta_{0it} + \beta_{1it}\text{LOG}(GDP_{CHINA})_{it} + \beta_{2it}\text{CLAIM}_{it} + \beta_{3it}\text{CLAIM} * \text{LOG}(GDP_{CHINA})_{it} \quad (1) \\ &+ \beta_{4it}\text{EXPORT} * \text{LOG}(GDP_{CHINA})_{it} + \beta_{2it}\text{IMPORT} * \text{LOG}(GDP_{CHINA})_{it} + \varepsilon_{it} \end{aligned}$$

b. Financial linkage (Equation 2):

$$\begin{aligned} \text{LOG}(GDP_{ASEAN-6})_{it} &= \beta_{0it} + \beta_{1it}\text{LOG}(GDP_{CHINA})_{it} + \beta_{2it}\text{CLAIM}_{it} + \beta_{3it}\text{CLAIM} * \text{LOG}(GDP_{CHINA})_{it} \quad (2) \\ &+ \beta_{4it}\text{IHSG} * \text{LOG}(GDP_{CHINA})_{it} + \varepsilon_{it} \end{aligned}$$

In the equation above, the independent variable is china's GDP and the independent variable is shown by ASEAN-6 GDP. Meanwhile, the ratio of exports to total exports and the ratio of imports to total imports as a moderating variable. Equation 2 is similar to equation 1, but in equation two the moderating variable changes to IHSG.

RESULTS AND DISCUSSION

Panel Least Square Result Test

The first regression would like to show China's spillover of economic growth in ASEAN-6 before and after the renminbi internationalization. By using the Panel Least Square method and Hausman Test has been done which shows p value > 0.05 . This shows that the hypothesis is not reject H_0 which means the chosen estimation model is the Random Effect Model. The results of the regression in the first estimate (Table 2), China's GDP, trade linkage (Export and Import), and Financial Linkage (IHSG) before Renminbi internationalization had a positive effect on economic growth in ASEAN-6 (GDPASEAN-6). Therefore, China's economic growth can affect economic growth in ASEAN-6, if GDPCHINA rises by 1% then GDPASEAN-6 will increase by 0.287 percent. Based on the results of the second estimation regression (Table 2), it can be seen that even after the renminbi internationalization, China's GDP still has a positive effect on ASEAN-6 GDP. This means that for every 1 percent increase in China's GDP, the ASEAN-6 GDP will increase by 0.150 percent. In addition, trade linkage in the form of export and import has a significant influence on the ASEAN-6 GDP, where exports and imports have a positive effect. The Financial Linkage (IHSG) and the Claim of Renminbi in the Global Reserve Currency also have a significant influence on economic growth in ASEAN-6 (ASEAN GDP). Economic Spillover from China on the economy in ASEAN-6 is more evident. According to Xu (2017), there is an increase in spillover from China to Southeast Asia after the internationalization of the renminbi, especially through trade channels.

Table 2 CHINA'S ECONOMICS SPILLOVER TO ASEAN ECONOMIES

Variable	Variable Dependent: LOG(GDPASEAN6)			
	(I)		(II)	
	Coefficient	Prob.	Coefficient	Prob.
C	16.5222	0.0000****	20.4625	0.0000****
LOG(GDPCHINA)	0.2879	0.0000****	0.1507	0.0026****
EXPORT	0.7874	0.0000****	0.7902	0.0000****
IMPORT	0.5090	0.0028****	0.3187	0.0488***
IHSG	0.0000021	0.0738**	0.00019	0.0920**
CLAIM			0.0000528	0.0000****
R-squared	0.5922		0.6471	
No. Observation	168		168	

*) significant level α 20%; **) significant level α 10%; ***) significant level α 5%; ****) significant level α 1%

Among the five independent variables, exports to China had the most influence on economic growth in ASEAN-6. This is due to a shift in China's behavior from investment to consumptive. Therefore, an increase in China's consumption demand will have a positive impact on ASEAN countries as exporting countries, particularly demand for services that can benefit several countries such as the Philippines, Thailand and Laos. In addition, increased demand for commodity goods can also benefit several countries such as Indonesia and Malaysia (Constantinescu, Mattoo, & Ruta, 2018). In addition, imports from China significantly affect ASEAN-6 GDP positively with a significant level of 5%, which means that for every 1 unit increase in imports, the ASEAN-6 GDP will increase by 0.31 percent. According to The Observatory of Economic Complexity (2016) 49% of China's total exports to Asia are machines. When countries in ASEAN-6 import large amounts of machinery with the assumption that machines can make companies more efficient and can increase productivity, the increase in imports of these machines can increase productivity which in turn can increase economic growth in ASEAN-6. That why, it can be stated that China's spillover through trade linkage has a positive effect on ASEAN-6 economic growth.

Table 3 EFFECT OF SHANGHAI STOCK EXCHANGE COMPOSITE INDEX TO STOCK PRICE INDEX ASEAN-6

Variable Dependent: IHSGASEAN-6		
Variable	Coefficient	Prob.
C	2185.602	0.0461***
IHSGCHINA	0.2826	0.0000****
R-squared		0.1177
No. Observation		168

*) significant level α 20%; **) significant level α 10%; ***) significant level α 5%; ****) significant level α 1%

Based on Table 2, financial linkage has a significant impact on the economic growth of ASEAN-6 countries positively. When the IHSG ASEAN-6 increased by 1 unit of currency, the ASEAN-6 GDP rose by 0,00019 percent. Therefore, financial linkage also has an important role in China's spillover on the ASEAN-6 economy, especially after the internationalization of the Renminbi (Xu, 2017). This study looks at financial linkage through the impact of stock movements using the Shanghai Stock Exchange Composite Index with the movement of stock prices in the ASEAN-6 stock market. Table 3 shows that the china's IHSG has a significant positive effect on the ASEAN-6 IHSG. Falling in china's stock prices can lead to shock on the global financial Volatility Index (VIX) which will have an impact on depreciation of currencies in developing countries (Dizioli, Guajardo, Klyuev, Mano, & Raissi, 2016).

This study uses the composition of the Renminbi claim in the Foreign Exchange Reserve as a proxy for the internationalization of the Renminbi. In Table 2, it shows that the claim has a significantly positive effect on ASEAN-6 GDP although the effect of claims on ASEAN-6 GDP is small, each increase in claims by 1 million USD, the ASEAN-6 GDP increases by 0.0000528 percent. Furthermore, in this study, we want to see trade linkage, financial linkage and claims can strengthen or weaken China's economic spillover to the ASEAN-6 economy by making these three variables as a moderating variable.

Moderated Regression ResultsTable 4 *EFFECTS OF TRADE LINKAGE AS MODERATING VARIABLES*

Variable Dependent: LOG(GDPASEAN-6)		
Variable	Coefficient	Prob.
C	19.4061	0.0000****
LOG(GDPCHINA)	0.1913	0.0000****
CLAIM	-0.00330	0.0660**
CLAIM*LOG(GDPCHINA)	0.000118	0.0625****
EXPORT*LOG(GDPCHINA)	0.0249	0.0000****
IMPORT*LOG(GDPCHINA)	0.0051	0.1779*
R-squared		0.1177
No. Observation		168

*) significant level α 20%; **) significant level α 10%; ***) significant level α 5%; *****) significant level α 1%

In the moderated regression analysis method, we use export and import variables as moderation variables. In this way, export and import variables can strengthen or weaken China's economic spillover on ASEAN-6 economic growth. In addition, we include the internationalization of the renminbi in the form of a renminbi claim in the foreign exchange reserve as a moderating variable to see how it can strengthen or weaken spillover. Based on the results of the third regression (Table 4), it can be seen that each moderating variable (Claim, Export, Import) strengthen the impact of the china's spillover (GDPCHINA) on the economic growth of ASEAN-6 (GDPASEAN-6). Internationalization of the Renminbi through the Renminbi claim in the foreign exchange reserve can significantly strengthen China's spillover by 1 percent, where a 1 million USD increase in claims will increase China's spillover to the ASEAN-6 economy by 0,000118 percent. In addition, trade linkage in the form of the ratio of exports and imports to China to total exports and imports of ASEAN-6 countries can strengthen China's Spillover to ASEAN-6. Exports strengthen spillover significantly at 1 percent. This means that every 1 unit increase in exports to China will strengthen China's spillover to ASEAN-6 by 0.249 percent. Country exports to China which have a large ratio of total exports can increase the amount of spillover (International Monetary Fund, 2016). Exports to China are the main transmission for china's spillover, when a decline in demand from China can reduce export growth which causes the country's growth to slow down (International Monetary Fund, 2016).

Table 5 *EFFECTS OF FINANCIAL LINKAGE AS MODERATING VARIABLES*

Variable Dependent: LOG(GDPASEAN-6)		
Variable	Coefficient	Prob.
C	21.20816	0.0000***
LOG(GDPCHINA)	0.119660	0.0000***
CLAIM	-0.00000274	0.0000***
IHSG*LOG(GDPCHINA)	0.000000437	0.0160**
CLAIM*LOG(GDPCHINA)	0.0000000969	0.0179**
R-squared		0.9511
No. Observation		168

*) significant level α 20%; **) significant level α 10%; ***) significant level α 5%; *****) significant level α 1%

Based on the results of the fourth regression, the financial linkage in the form of the IHSG becomes a moderating variable that can strengthen or weaken China's spillover to ASEAN-6 (Table 5). It is known that the IHSG has a

significant impact in strengthening the china's Spillover by a significant level of 1 percent, where every 1 percent increase in the IHSG will strengthen the china's spillover by 0.000000437 percent. It can be stated that IHSG can directly impact the economic growth of ASEAN-6 or it can strengthen China's spillover in influencing the economic growth of ASEAN-6. Based on the results of the moderation regression, it can be seen that ASEAN-6 exports to China greatly strengthen the china's spillover to ASEAN-6 compared to other variables. Thus, with the internationalization of the Renminbi, trade linkage remains the biggest impact in China's spillover on the ASEAN-6 economy.

CONCLUSION AND RECOMMENDATIONS

China's economy towards the global is large enough so that China's role in other countries is also quite large, especially in Southeast Asia. Therefore, economic growth in other countries, especially ASEAN-6, receives economic spillover from China through trade linkage and financial linkage. China plan to expand its trade and investment, because of that China is trying to include the Renminbi into international currency. The internationalization of the Renminbi began in 2005 and in 2016 the Renminbi was recognized by the International Monetary Fund by including the Renminbi in a basket of Global reserve currency (Special Drawing Rights). The internationalization of the Renminbi strengthened China's spillover to ASEAN-6. In addition, trade linkage and financial linkage strengthen China's economic spillover against ASEAN-6, with the trade linkage that most strengthens China's spillover.

THEORETICAL AND PRACTITIONER IMPLICATIONS

This research about China's spillover of Southeast Asia needs to be researched and developed again. This research also shows that the internationalization of the Renminbi can strengthen China's spillover. However, the internationalization of China has not been able to increase financial linkage. The results of this study suggest that future studies focus on China's spillover through financial linkage after the internationalization of the Renminbi. China can be a good prospect for the growth of emerging market countries in Asia, policy makers must pay attention to the spillover from China or the US economy.

LIMITATIONS

Apart from this valuable insight, the results in this study still have some shortcomings including the scope of china's spillover research is limited to only 6 countries in ASEAN so that the results found cannot be applied in other countries, the span of time is too short to see the effect of the internationalization of the Renminbi given the Renminbi internationalization new in 2016. In addition, choosing more appropriate variables to measure financial linkage in order to provide more precise and accurate findings.

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APPENDICES**Appendix 1**

Panel Least Square Result

a. Before Renminbi Internationalization

Dependent Variable: LOG(GDPASEAN6)

Method Panel EGLS (Cross-section random effects)

Date: 10/26/19 Time: 14:47

Sample: 2012Q1 2018Q4

Periods included:28

Cross-sections included: 6

Total panel(balanced) observations: 168

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
	16.52226	1.246 140	13.25876	0.0000
LOG(GDPCHINA)	0.287939	0.044074	6.533102	0.0000
EXPORT	0.787488	0.106905	7.366264	0.0000
IMPORT	0.509042	0.167759	3.034364	0.0028
IHSG	2.16E-05	1.20E-05	1.799 123	0.0738

Effects Specification

	S.D.	Rho
Cross-section random	0.500214	0.9820
Idiosyncratic random	0.067706	0.0180

Weighted Statistics

R-squared	0.592258	Mean dependent var	0.639911
Adjusted R-squared	0.582252	S.D. dependent var	0.108721
S.E. of regression	0.070270	Sum squared resid	0.804872
F-statistic	59.19054	Durbin-Watson stat	0.817732
Prob (F-statistic)	0.000000		

Unweighted Statistics

R-squared	-0.033540	Mean dependent var	25.02485
Sum squared resid	123.6621	Durbin-Watson stat	0.005322

b. After Renminbi Internationalization

Dependent Variable: LOG(GDPASEAN6)

Method Panel EGLS (Cross-section random effects)

Date: 10/26/19 Time: 14:44

Sample: 2012Q1 2018Q4

Periods included:28

Cross-sections included: 6

Total panel(balanced) observations: 168

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	20.46251	1.399973	14.61636	0.0000
LOG(GDPCHINA)	0.150778	0.049205	3.064303	0.0026
EXPORT	0.790273	0.099457	7.945867	0.0000
IMPORT	0.318747	0.160589	1.984862	0.0488
IHSG	1.90E-05	1.12E-05	1.694923	0.0920
Effects Specification				
			S.D.	Rho
Cross-section random			0.500236	0.9844
Idiosyncratic random			0.062986	0.0156
Weighted Statistics				
R-squared	0.647183	Mean dependent var		0.595304
Adjusted R-squared	0.636294	S.D. dependent var		0.108435
S.E. of regression	0.065395	Sum squared resid		0.692796
F-statistic	59.43231	Durbin-Watson stat		1.003323
Prob (F-statistic)	0.000000			
Unweighted Statistics				
R-squared	-0.035802	Mean dependent var		25.02485
Sum squared resid	123.9327	Durbin-Watson stat		0.005609

c. IHSGCHINA to IHSGASEAN-6

Dependent Variable: IHSG

Method Panel EGLS (Cross-section random effects)

Date: 10/26/19 Time: 14:48

Sample: 2012Q1 2018Q4

Periods included:28

Cross-sections included: 6

Total panel(balanced) observations: 168

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	2185.602	1087.647	2.009478	0.0461
IHSGCHINA	0.282651	0.060036	4.708005	0.0000
Effects Specification				
			S.D.	Rho
Cross-section random			2631.312	0.9695
Idiosyncratic random			466.3735	0.0305
Weighted Statistics				
R-squared	0.117797	Mean dependent var		99.40368
Adjusted R-squared	0.112483	S.D. dependent var		495.0458
S.E. of regression	466.3735	Sum squared resid		36105705
F-statistic	22.16531	Durbin-Watson stat		0.327819
Prob (F-statistic)	0.000005			
Unweighted Statistics				
R-squared	0.004772	Mean dependent var		2969.364
Sum squared resid	1.01E+09	Durbin-Watson stat		0.011772

Appendix 2

Moderated Regression Results

a. Export and Import as Moderation Variable

Dependent Variable: LOG(GDPASEAN6)

Method Panel EGLS (Cross-section SUR)

Date: 10/26/19 Time: 14:53

Sample: 2012Q1 2018Q4

Periods included:28

Cross-sections included: 6

Total panel(balanced) observations: 168

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	19.406 14	1.072409	18.09584	0.0000
LOG(GDPCHINA)	0.191278	0.037836	5.055445	0.0000
CLAIM	-3.30E-05	1.78E-05	-1.851323	0.0660
CLAIM*LOG(GDPCHINA)	1.16E-06	6.20E-07	1.875742	0.0625
EXPORT*LOG(GDPCHINA)	0.024956	0.002281	10.94008	0.0000
IMPORT*LOG(GDPCHINA)	0.005075	0.003750	1.353230	0.1779
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.997531	Mean dependent var	348.4428	
Adjusted R-squared	0.997374	S.D. dependent var	361.5872	
S.E. of regression	1.012542	Sum squared resid	160.9627	
F-statistic	6343.446	Durbin-Watson stat	1.070199	
Prob (F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.994595	Mean dependent var	25.02485	
Sum squared resid	0.646662	Durbin-Watson stat	0.967167	

b. IHSG as Moderation Variable

Dependent Variable: LOG(GDPASEAN6)

Method Panel EGLS (Cross-section SUR)

Date: 10/26/19 Time: 15:57

Sample: 2012Q1 2018Q4

Periods included:28

Cross-sections included: 6

Total panel(balanced) observations: 168

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
c	21.208 16	0.672663	31.52864	0.0000
LOG(GDPCHINA)	0.119660	0.023610	5.068250	0.0000
CLAIM	-2.74E-05	1.15E-05	-2.391669	0.0179
CLAIM*LOG(GDPCHINA)	9.69E-07	3.98E-07	2.435145	0.0160
IHSG*LOG(GDPCHINA)	4.37E-06	9.18E-08	47.60087	0.0000
Weighted Statistics				
R-squared	0.951165	Mean dependent var	601.1175	
Adjusted R-squared	0.949966	S.D. dependent var	475.9056	
S.E. of regression	1.005427	Sum squared resid	164.7741	
F-statistic	793.6867	Durbin-Watson stat	1.106990	
Prob (F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.145098	Mean dependent var	25.02485	
Sum squared resid	102.2882	Durbin-Watson stat	0.005930	