

## Is Population Growth Among Factors that Drive Foreign Portfolio Investment in China?

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### Abstract:

The study presented in this research article investigates the impact of population on foreign portfolio investment in China. We used annual data from 2005 to 2016 by applying the OLS multiple regression method.

The result showed the existence of strong relationship between foreign portfolio investment and China's population growth with other macroeconomic variables, especially: gdp, fdi, exchange rates and external debt.

Further, the results showed a positive effect of population growth in China on foreign portfolio investment flows.

**Key words:** Chinese stock market, foreign portfolio investment, population growth.

**JEL classification codes:** G10, G11, G38.

## 1. INTRODUCTION:

China is the biggest emerging market in the world and has confirmed its position in the global economy during the global crisis of 2008. Economic data and international indicators proved that China has an important role as a result of its large economic growth rates. Therefore, there is a growing interest on the Chinese government choices namely controversies between financial market sophistication and high growth rates, the main objective of public policy is to attract foreign portfolio which determined by multiple factors related to this market, for example, providing information, easy transactions, exercise procedures to protect investors, or related by macroeconomic variables for example economic growth, external debt, exchange rate and population growth.

In addition, since China is world leader in terms of population, the pace at which population growth consists a fruitful theme for many researchers, especially in relation to economic growth. In this regard, economic theories are divided into two mainstream doctrines, the first approach "population pessimists" believes that rapid population growth reflects negative outcomes on the economic growth, and the associated impoverishment, on the grounds that it restricts technological and capital accumulation (Coale and Hoover 1958). The second approach "population optimists" believes that rapid population growth has a positive result on the economy, arguing that it encourages technological and institutional innovations (Simon 1981). In addition to general population growth and its effect on the economy, some recent studies stressed on the demographic structure of the population, by focusing on working and non-working age and the impact of both aging and the baby boomers on economic growth.

As a result, researchers were very interested in the relationship between population growth and economic growth in China. Yet, studies that investigate the impact of population growth on the financial market, especially the effect of population growth on attracting foreign portfolio investment, has received little attention.

The study’s objective is to conduct some investigations on this important issue and be interested in finding the impact of China population growth rates and some other macroeconomic variables on foreign portfolio investment flows from 2005-2016. Therefore, the study seeks to answer the following research question:

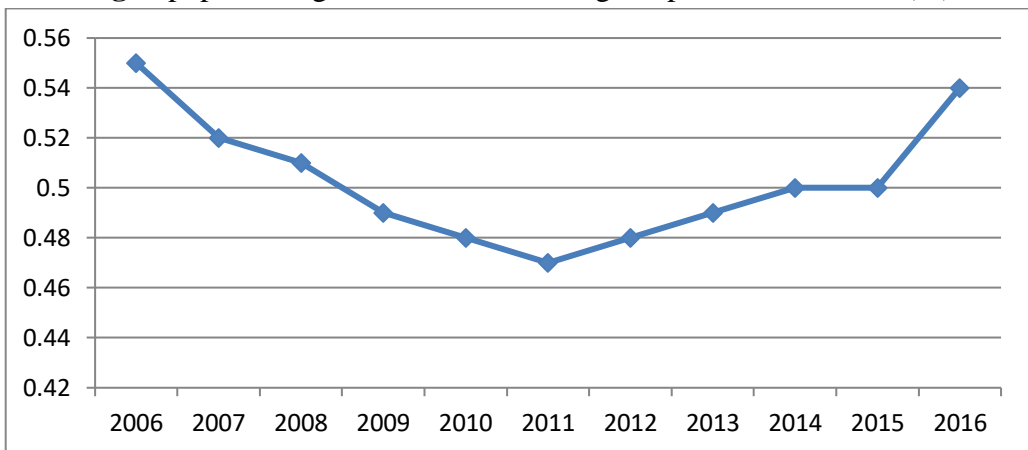
**Do China population growth rates have an effect on foreign portfolio investment flows?**

**2. LITERATURE REVIEW**

**Population growth in China:**

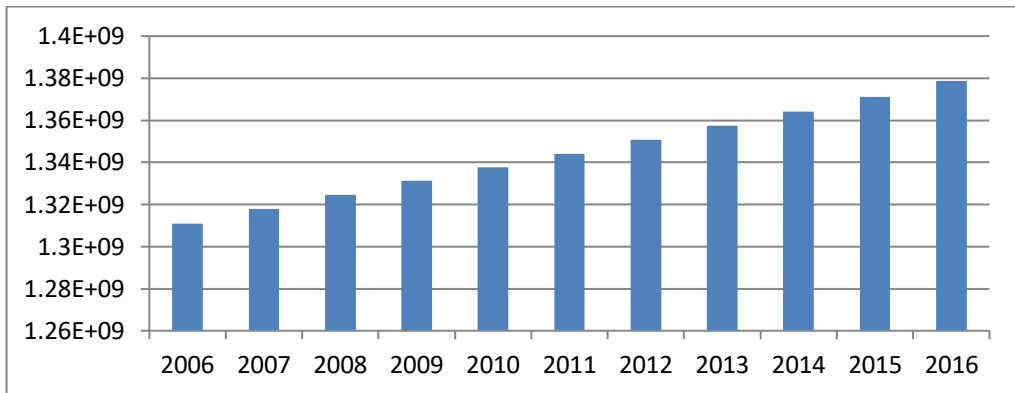
China is an emerging country feature large in size of population, with about two thirds of the world's population live in China and Indi , Over the past China has many structural reforms and adopted policies can achieve development, 38 years ago Chinese government established the one-child policy to reduce the high population growth which implemented by Deng Xiaoping in 1979 (Floyd, 2015), after decades this policy, it has launched another policy named two-child policy in January 1, 2016, it was dispensed the one-child policy and the policy allows every married couples to have two children (Lan, 2016), the following two figures represent the evolution of China's population growth rates and sizes during 2006-2016.

**Fig.1.** population growth in China during the period 2006-2016 (%)



**Source:** Authors' based on World Bank data base.

**Fig.2.** total population in China during the period 2006-2016 (billion people)



**Source:** Authors' based on world bank data base.

Consider the curve shown in the Fig. 1. we show that the direction of the curve has not changed and the china's population growth rates are lighter and not exceed the average 0.49% during the period 2006-2015, and the population size ranged from 1.31 and 1.37 billion people between 2006 to 2015, but if we compared between those rates before 30 years we see that the annual china's population growth rate has slowed largely and even lower than some developed countries due to the one child policy, And because of the two child policy the population rates are slightly improved and grow by 0.54% in 2016, and as shown in Fig.2. we see that the population size is slightly increased to reach about 1,378 billion people, in 2017 china's population size was estimated at 1,39 billion people (Kaneda, 2017).

In addition to the economists expected that china's population will be reduced significantly coming years if the current policies unchanged, and according to the UN released updated population figures and projections in 2015 by 2022, India will exceed the rate of China and will reach 1.7 billion through in 2050 (Khokhar, 2015).

**Population and economic growth and foreign portfolio investment:**

Many studies have explained the relationship between economic growth and population growth and have differed in their results, an addition

population increases are generally an important and predictable contributor to economic growth, Because the larger the population, the more workers who eventually enter the workforce also increase production and consumption (Moore, 2016), For example, china has the highest population growth rate with an average of 0.51% in the years 2001-2016 and has achieved a good economic growth rate as well, indicating that demographic factors make an important contribution to this growth disparity.

Yet, there are a few studies examined the relationship between population growth and the performance of stock markets, some those researches indicating a significant positive relationship, for example a study conducted by researchers at YALE university and the university of California that has reached population shifts can affect investor decisions and equities values, to base supply and demand this means that market prices are affected by ratios of buyers and sellers for an asset in this market (Kisser, 2014).

And about the impact of population growth on capital some theoretical analyses that explain that high population growth reduces the public and private capital formation, it also reduces the capital per worker (Akinwande And others, 2012), another word, economists agreed that high birth rates are good for the market while low birth rates that appear through bad aging of the market (Weeks, 2018).

Some studies had shown that the demographic transition had led to a rapid increase in per capita output in many east Asian countries, where the demographic transition had been particularly rapid and also the study of David E Bloom and Jeffrey G Williamson (1997) suggests that the impact of population growth only shows when the working-age population is growing at different rates It found that demographic change in future will reflect negatively on growth rates in East Asia while rapid economic growth in East and South Asia will be strengthened (Bloom And Wiliamson, 1997), an addition other research also suggests that there is a no significant

relationship between the two variables and has found that demographic growth accounts for only 50 % of equities values (Bloch, 2018).

According to the saying of the economist Jeffrey Kleintop (Cfa Senior Vice President Chief Global Investment Strategist Charles Schwab & Co., Inc) "the demographics are a powerful force, but they aren't the only force" which represent Venezuela as an example because it has a good demographic characteristics, but it hasn't a good management, according to Jeffrey Kleintop In the coming years could lead to decline in the percentage of workers that support the population fears that the United States will fall in an environment of slow growth and social programs, It is expected that this low growth and increasing reliance on social programs that affect global stock and bond markets (Fuscaldo, 2018), so according to this researcher countries can achieved a significant gains as a result of which demographic change can provide an opportunity to achieve faster economic growth if the policy environment is supportive.

This means that the profit margins obtained by investors are likely to decline if the improvement in corporate productivity declines. slow population growth also leads to the fact that increases in revenues may be modest. These factors will have a negative impact on revenue growth and in this case investors must look for industries and companies that can provide revenue, and they must also consider growth forecasts for the coming years to anticipate other factors that could have a negative impact on revenue performance. In the event of slower population growth, productivity must be significantly improved to sustain global growth (Wien, 2015).

For China some approach believe that it has pursued policies aimed at slowing population growth and reduction that threatens to undermine China's economic success, a new approach was needed and fast implementation. Low fertility in China from high levels in the past to return and increase in economic growth because the fertility decline pushed the proportion of the working-age population and increased investment in health and education and raising women's participation in the workforce and raising savings rates Investment, however, they believe that when very

low fertility becomes a problem where high fertility total fertility rate by the decline in the birth of 1.5 or less create problems, and the number of workers has begun in China, which is the main engine of the economy will decline lead to lower economic growth And the rapid ageing of the population that makes it more difficult to support public programs that provide social care for the elderly ( Mason, 216).

So, according to the foregoing, a large population growth can have a directly affect on the attraction of foreign portfolio investment that means large consumption and demand therefore rises and also labor provides the production thus rises and the yield thus rises digging the order in which foreign investors invest, or indirectly affect In influencing the economic growth that investors consider to be one of the ones influencing the decisions of foreign investors through their analysis of the country's overall economic situation, It may also the high population rate affect adversely on national savings rates on capital, which reflects negatively on the investment climate (Ali and Others, 2015), Studies in support of the importance of fertility reduction have found that countries have achieved high rates of economic growth and have been able to reduce poverty by means of integrating family planning policies and programmes into their economic reforms (W.Sinding, 2009).

Now, theoretically we became to know the importance of the population growth in general and demographic characteristics in the economy and investment in stock markets, but there are many factors can determined the attractive of foreign portfolio investment we'll summarize those later.

#### **Other factors can effect on foreign portfolio investment:**

Performance of various macroeconomic factors can affect on financial market on general and specially the foreign portfolio investment, but the power of influence between financial market development and those variables will vary from time to other and from country to another.

Some economists believe that there is a positive relationship between macroeconomic variables because the integration of real and financial economy (Fama (1981) ), While other economists believed that the two variables have a negative relationship sometimes, because the investors expect returns are driven by a combination of the company's Interior as well as company's future revenue projections, This justifies still the financial markets in emerging economies less developed while their economies achieved high growth rates.

As many studies have addressed the relationship between market performance and fundamental economic variables and with mixed results, for example lesson Zhao (2010) the relationship between Exchange rates and stock prices during the period from January 1991 to Joan 2009 study found no relationship. Long-term balance between variables, while the study of Cao (2012) showed a relation between the same two variables during the period July 2005-January 2012, Bellalah study & Habiba (2013) that Chinese stock prices positively linked with interest rates, industrial production and money supply on Short and long term 2005-2010 period (Liang and Willett, 2016), but both Liu and Shrestha (2008) confirmed that there is a significant relationship between Chinese stock index and various economic variables and negative relationship between interest rates and inflation and exchange rates and the performance of the Chinese market. index (Ozcan, 2012).

### **3. METHODOLOGY AND RESULTS:**

#### **3.1. Data and Variables:**

Data used in this analysis for PFI, P, GDP, FDI, EXR, EXD is taken from World Bank site for the period from 2006 to 2016, The data of all variables is taken on annual bases and the currency unit is US dollar.

Our study aimed to examine the effect of population growth and some variables

Of FPI in China, the dependent variable in our study is the foreign portfolio investment flows and the independent variables are population



growth, total foreign direct investment , total gross domestic product, exchange rates US/ UN, external debt.

And population growth are used as independent variables.

**Variables are abbreviated as follows:**

**Table 1.** Description of variables

<b>Variable</b>	<b>Description</b>
<b>Foreign Portfolio Investment (FPI)</b>	Dependent Variable
<b>Population Growth (P)</b>	Independent Variable
<b>Gross Domestic Product (GDP)</b>	Independent Variable
<b>Foreign Direct Investment (FDI)</b>	Independent Variable
<b>Exchange Rate (EXR)</b>	Independent Variable
<b>External Debts (EXD)</b>	Independent Variable

**Source:** author's.

### **3.2. Research Hypothesis:**

The following Hypotheses are developed in light of theoretical discussion in the previous section, and will be used to certify the role of above mentioned macroeconomic variables and the foreign portfolio investment.

So, we use in this study two Hypothesis

Hypothesis H<sub>0</sub>: There is not significant relationship between population growth on FPI.

Hypothesis H<sub>1</sub>: There is a significant relationship between population growth and FPI.

Statistical Analyses.

### **3.3. Estimation of Model:**

We used a linear multiple regression model on our study based on the study of Muhammad Afaq Haider (2016).

FPI is function of the other variables, we can develop this into mathematical form:

$$\mathbf{FPI = C(1)*P + C(2)*GDP + C(3)*FDI + C(4)*EXR + C(5)*EXD + C(6)}$$

**Estimation of linear regression model:**

According to Table 1. the model takes the following form:

```

Estimation Command:
=====
LS FPI P GDP FDI D(EXR) EXD C

Estimation Equation:
=====
FPI = C(1)*P + C(2)*GDP + C(3)*FDI + C(4)*D(EXR) + C(5)*EXD +
C(6)

Substituted Coefficients:
=====
FPI = 3.00812890077e+12*P + 0.0588940335675*GDP -
0.849649105315*FDI + 131870319333*D(EXR) - 0.357572702208*EXD
- 1.72151776922e+12
    
```

Source: author's based on Eviews 10.

This equation explains that FPI is a function of main variables (P, GDP, FDI, EXR, EXD).

**3.4. Statistical Analysis:**

**Test of Significance of parameter estimates:**

According to the results based on Eviews 10, we have the following table:

**Table 2.** Student Test and probability values

<b>Variables</b>	<b>B</b>	<b>T-statistic</b>	<b>T<sub>tab</sub></b>	<b>Prob</b>
P	B <sub>1</sub>	4.876545	1.943	<b>0.0046</b>
GDP	B <sub>2</sub>	4.422765	1.943	<b>0.0069</b>
FDI	B <sub>3</sub>	-3.379476	1.943	<b>0.0197</b>
D(EXR)	B <sub>4</sub>	2.993677	1.943	<b>0.0303</b>
EXD	B <sub>5</sub>	-4.862497	1.943	<b>0.0046</b>
C	B <sub>0</sub>	-4.695924	1.943	<b>0.0054</b>

Source: author's based on Eviews 10.

The table.2 shows that probability values for all variables are significant at the level of 5% (Prob < 0.05),

also, values of T-statistic are presented for all variables are significant at the level of 5% ( $T_{tab} = T_{n-k}^a = T_{(11-5)}^{0.05} = T_{6}^{0.05} = 1.943 < T_{cal}$ )

### Test of Significance of model:

To know the Significance of model we used Fisher test and R-squared value (Annex1):

- Value of Fisher test is presented for the model is significant ( $F_{cal} > F_{tab}$ )

$$F_{cal} = 12.15205 > F_{tab} = 5.050 \quad (F_{tab} = F_{n-k-1}^k = F_{11-5-1}^5 = F_5^5 = 5.050)$$

- The result of R-squared ( $R^2=0.92$ ) indicate that there is a strong relationship between FPI and the macroeconomic variables including in our study.

So, results of Fisher test and R-squared indicated that our regression model is significant.

### 3.5. Econometric Analysis:

We used White test, Jarque berra and Durbin watson tests to know the econometric significance of model:

- **White test:**

According to the table of White test based on eviews 10 (Annex2):

The table shows that:  $Obs * R^2 = 7.88 < \chi_{tab}^2$  ( $\chi_{tab}^2 = \chi_5^2, 0.05 = 11.07$ )

So, the result of white test indicate that variance of errors in our regression model is constant.

- **Jarque-Bera test:**

The table of Jarque-Bera test based on E-views-10 (Annex3) indicate the following result:

$$\chi_k^2_{0.05} = \chi_5^2_{0.05} = 11.07 > \mathbf{J.berra\ value = 0.752}$$

So, data have the skewness and kurtosis matching a normal distribution at the level of 5%.

- **LM test:**

The result of LM test (Annex4) indicate that: **Prob F(2,3)=0.4519 > 0.05**

So, there is no autocorrelation in the errors in our regression model.

#### **4. RESULTS AND DISCUSSION**

China's population growth has a direct or indirect impact on attracting portfolio investment through higher levels of consumption, which leads to a higher demand and provides the labour supply. This consequently reinforces the productivity of enterprises; as it positively affects the returns of these institutions which are the foremost target of the foreign investors. Moreover, population growth has an indirect impact as well; it sustains the economic growth and boosts the foreign direct investment.

It is evident that the augmentation of China's economic growth is a catalyst for investors and is an important factor in determining investment decisions in the stock market due to the positive expectations which the investors build basing on the big rates achieved by the economy. Needless to mention that the decline in the exchange rate makes local companies more competitive, which leads to an increase in exports and thus to the increase in stock prices which generate a positive correlation between the exchange rates and prices and returns of Chinese stock market, which is positively reflected on the foreign portfolio investment. Regarding the impact of foreign indebtedness on the investors' decisions in the Chinese financial market, the exacerbating foreign debt stocks in addition to the fears of non-payment could reduce China's credit ratings by global rating agencies; eventually, it can lead to the reluctance of the foreign investors to invest in the Chinese stock exchange.

Ultimately, the negative relationship between foreign direct investment and portfolio investment is explained by the economic approach that FDI is an alternative for FPI, especially in emerging countries, and for China the safety and profitability of Foreign direct investment and high risk of portfolio investment explains why foreign investors prefer direct

investment rather than portfolio investment.

## 5. CONCLUSION:

The Chinese government trying to continue its high economy growth rates that achieved in the past, and decision makers believe that rapid population growth hinders the economic development, for that they make a combination of policies to limit population growth for example the one-child policy (1980) and two child policy (2016) because of concerns that negatively affect China's population size on the continuation of high economic growth rates and attractive more foreign capital flows to stock markets.

By studying the impact of China's population growth rates on foreign portfolio investment by linear multiple regression we find that there is a positive effect of Chinese population on the performance of stock market, where the high population growth in China can helps to attract foreign capital and promote the investments because the size of population in can raising the consumption and demand which affect positively on economic growth and the direct investment and makes the companies offer high returns that's makes China a good destination for indirect investment and also affects companies by providing high returns and which makes Chinese stock market a good destination for foreign investors.

The results of our study correspond with previous studies that found this positive effect, for example study of muhammad afaq haider and Muhammad Asif Khan (2016) and the study of fayyaz ahmad and Muhammad Umar Draz (2015).

We also specify the variables that affect on attraction of foreign investment just lifted has voids from similar population growth based on multiple regression model these variables include both total gross domestic product and foreign direct investment flows and exchange rates as well as external debt, the study found both economic growth and external debt had a positive impact on foreign investment while it just lifted has voids from

the exchange rate and foreign direct investment had a negative impact, the study explains that the most important factor affecting my game just lifted has voids from investment.

So China is among countries with lower fertility China is facing a decline in the labor force, now raising the productivity is a big challenge for Chinese decision makers, therefore the Chinese government must raise more efforts for continued economic growth in the future rather than using policies has negatively affect on important resources as fertility reduction policies, and China should revise its policies on fertility and the various policies to attract more foreign capital to stock market.

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## 7. Appendices

### Appendix 1. result of estimation model.

Dependent Variable: FPI

Method: Least Squares

Date: 05/12/18 Time: 11:46

Sample: 2006 2016

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
P	3.01E+12	6.17E+11	4.876545	<b>0.0046</b>
GDP	0.058894	0.013316	4.422765	<b>0.0069</b>
FDI	-0.849649	0.251414	-3.379476	<b>0.0197</b>
D(EXR)	1.32E+11	4.40E+10	2.993677	<b>0.0303</b>
EXD	-0.357573	0.073537	-4.862497	<b>0.0046</b>
C	-1.72E+12	3.67E+11	-4.695924	<b>0.0054</b>
R-squared	<b>0.923966</b>	Mean dependent var	-9.83E+09	
Adjusted R-squared	0.847932	S.D. dependent var	5.19E+10	
S.E. of regression	2.02E+10	Akaike info criterion	50.60299	
Sum squared resid	2.05E+21	Schwarz criterion	50.82002	
Log likelihood	-272.3164	Hannan-Quinn criter.	50.46618	
F-statistic	12.15205	Durbin-Watson stat	<b>2.400754</b>	
Prob(F-statistic)	0.007965			

Source: author's based on Eviews 10.

### Appendix.2 result of White Test.

Heteroskedasticity Test: White

F-statistic	2.535519	Prob. F(5,5)	0.1651
Obs*R-squared	7.888717	Prob. Chi-Square(5)	0.1625
Scaled explained SS	1.962695	Prob. Chi-Square(5)	0.8543

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 05/12/18 Time: 21:04

Sample: 2006 2016

Included observations: 11

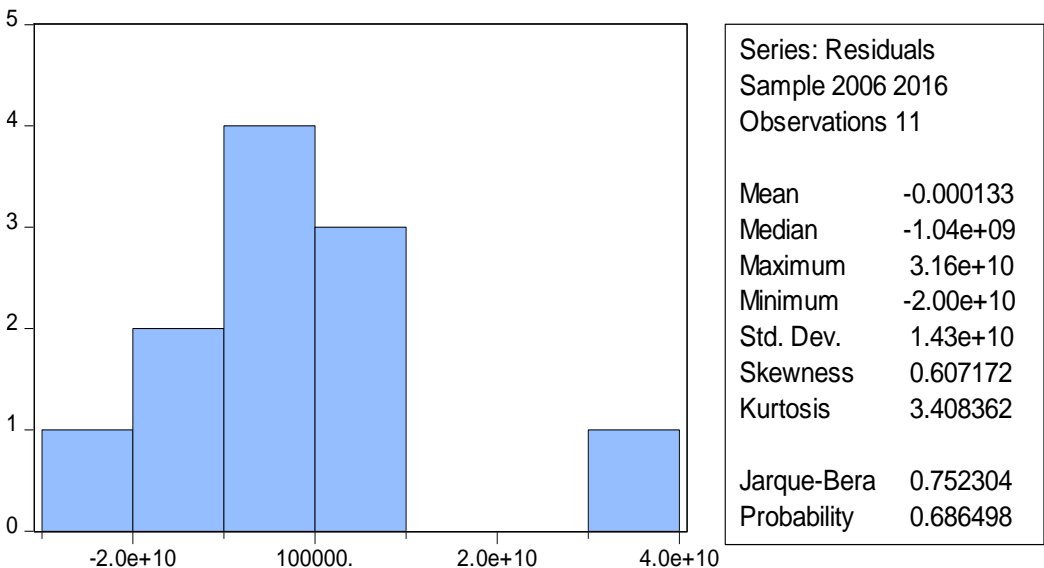
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.01E+21	1.20E+21	-0.847749	0.4353
GDP_TOTAL^2	4.93E-06	4.46E-06	1.105078	0.3194
FDI_TOTAL^2	0.018830	0.006515	2.890386	0.0342
D(EXR)^2	1.08E+20	6.29E+20	0.172053	0.8701
EXD_TOTAL^2	-0.000194	0.000196	-0.989762	0.3677
P^2	2.66E+21	4.09E+21	0.649768	0.5445

R-squared	0.717156	Mean dependent var	1.86E+20
Adjusted R-squared	0.434312	S.D. dependent var	3.03E+20
S.E. of regression	2.28E+20	Akaike info criterion	96.89328
Sum squared resid	2.60E+41	Schwarz criterion	97.11031
Log likelihood	-526.9130	Hannan-Quinn criter.	96.75647
F-statistic	2.535519	Durbin-Watson stat	3.174344
Prob(F-statistic)	0.165106		

Source: author's based on Eviews 10.

**Appendix 3.** result of Jarque-Bera test.



Source: author's based on Eviews 10.

**Appendix 4.** result of LM test.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.047166	Prob. F(2,3)	0.4519
Obs*R-squared	4.522213	Prob. Chi-Square(2)	0.1042

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 05/12/18 Time: 21:28

Sample: 2006 2016

Included observations: 11

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP_TOTAL	0.010066	0.015227	0.661056	0.5558
FDI_TOTAL	-0.182086	0.279954	-0.650415	0.5618
D(EXR)	6.12E+09	4.68E+10	0.130842	0.9042
EXD_TOTAL	-0.056524	0.086188	-0.655820	0.5587
P	4.17E+11	6.76E+11	0.616589	0.5811
C	-2.55E+11	4.04E+11	-0.631248	0.5727
RESID(-1)	-0.473313	0.551861	-0.857668	0.4541
RESID(-2)	-0.687427	0.520521	-1.320651	0.2783
R-squared	0.411110	Mean dependent var		-0.000133
Adjusted R-squared	-0.962966	S.D. dependent var		1.43E+10
S.E. of regression	2.01E+10	Akaike info criterion		50.43711
Sum squared resid	1.21E+21	Schwarz criterion		50.72649
Log likelihood	-269.4041	Hannan-Quinn criter.		50.25470
F-statistic	0.299190	Durbin-Watson stat		2.242267
Prob (F-statistic)	0.914570			

**Source:** author's based on Eviews 10.