ANALYSIS ON THE INFLUENCING FACTORS OF CHINA'S FOREIGN RESERVE

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ABSTRACT
With the promotion of economic globalization and frequent international economic and trade exchanges, China has been in a long-term foreign trade surplus since the reform and opening up. At present, China has become the largest foreign exchange reserve country in the world. The long-term past has caused a loss to China's domestic economy. Based on the regression model of import and export difference, exchange rate, foreign direct investment and GDP, it is found that the difference of import and export, exchange rate and GDP have influence on China's foreign exchange reserve.

Key words: *foreign exchange reserve; GDP; import and export balance;*

1. FOREWORD
With the strong com prehensive national strength of our country, the stability and peace of our society, and the rapid development of our economy, more and more foreign investors are willing to take root in our country's land. This has led to the rapid expansion of China's foreign exchange reserves, which are mainly affected by supply and demand factors. They are one of the indicators of a country's comprehensive national strength, and they regulate the balance of payments. Maintain exchange rate stability and maintain the international credibility of the important role of the country. With China's balance of payments surplus for more than a decade, by the end of March 2012, China's foreign exchange reserves had reached 3.305 trillion yuan [1].With the large amount of vicious hoarding of foreign exchange reserves, there are some potential and real losses and risks. In order to better control the scale of foreign exchange reserves, we should find out the main factors that affect foreign exchange reserves, and put forward better suggestions and methods in the light of these factors under the background of the basic economic conditions of our country. Regulate and control the scale of China's foreign exchange reserves to reduce the potential risks and drawbacks of our economy in the international community.

2. MODELING
2.1 variable selections
In this paper, the following variables are selected as research objects: import and export difference (IOP), exchange rate (ERA), foreign direct investment (FDI), GDP (gross domestic product) (GDP).

2.1.1 The balance of import and export reflects the status of a country's foreign exchange balance as a whole and the effect of foreign trade on the national economy. The trade surplus has always been the present situation of China's foreign economy, and its exports are greater than its imports. To a large extent, China's foreign exchange reserves increased.

2.1.2 The exchange rate (ER). The size of the exchange rate change determines the exchange price between the local currency and foreign currency, which is the main factor affecting China's foreign exchange reserves through foreign trade. When the devaluation, if China meets the Marshall Lerner condition, by limiting import and export expansion policy, thereby increasing foreign exchange reserves [2].

2.1.3 Foreign direct investment (FDI) is the main reason of our country's foreign exchange reserve through the analysis of the original data in "China Statistical Yearbook Table 2016".

2.1.4 sample selection and data collection Gross domestic Product (GDP). The core index of national accounting, a measure of a country's economic growth.

2.2 Sample selection and data collection

According to the study, there is a linear relationship between foreign exchange reserves and the above four factors. Therefore, the regression equations between import and export difference (X 1), exchange rate (X 2), foreign direct investment (FDI), GDP (X 5) are established. This paper collates the original data from Table 2016 of the Statistical Yearbook of China, and selects the annual data from 2006 to 2016 for empirical analysis (E. g. Table 1).

Table 1: annual data on foreign exchange reserves, import and export balances, exchange rates, foreign direct investment, gross domestic product (GDP), 2006-2016

Year	Foreign exchange reserves (billions of dollars)	Balance of imports and exports (billions of United States dollars)	Exchange rate (indirect pricing method)	Foreign direct investment (billions of US dollars)	Gross domestic product (billions of dollars)
2006	10663.40	1775.20	0.1254421	630.21	275.26
2007	15282.49	2639.40	0.1315097	747.68	355.38
2008	19460.30	2981.20	0.1439564	923.95	460.05
2009	23991.52	1956.90	0.1463914	900.33	511.02
2010	28473.38	1815.10	0.1477213	1057.35	610.13
2011	31811.48	1549.00	0.1548275	1160.11	757.57
2012	33115.89	2303.10	0.1584158	1117.16	856.03
2013	38213.15	2590.10	0.1614674	1175.86	961.12
2014	38430.18	3830.60	0.1627922	1195.62	1048.34
2015	33303.62	5939.00	0.1605548	1262.67	1106.30
2016	30105.17	5097.04	0.1505502	1260.01	1119.47

3 CONSTRUCTION OF MODEL

3.1 To establish a regression model

$$InY_i = \beta_0 + \beta_1 InX_{1i} + \beta_2 InX_{2i} + \beta_3 InX_{3i} + \beta_4 InX_{4i} + u_i$$

Use the Eviews software directly to perform OLS regression, and the results are shown in figure 1:

Dependent Variable: INY
Method: Least Squares
Date: 03/19/18 Time: 03:18
Sample: 2006 2016
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-46233.74	12502.67	-3.697910	0.0101
INX1	-1.748839	0.560075	-3.122512	0.0205
INX2	453647.1	111991.1	4.050742	0.0067
INX3	-1.395004	8.975371	-0.155426	0.8816
INX4	17.18677	6.436641	2.670146	0.0370

R-squared	0.984471	Mean dependent var	27531.87
Adjusted R-squared	0.974119	S.D. dependent var	9140.337
S.E. of regression	1470.457	Akaike info criterion	17.72749
Sum squared resid	12973468	Schwarz criterion	17.90835
Log likelihood	-92.50119	Hannan-Quinn criter.	17.61348
F-statistic	95.09610	Durbin-Watson stat	2.464877
Prob(F-statistic)	0.000015		

figure 1 results of overall regression analysis

Based on the data in Table 1, the corresponding regression expression is obtained:

$$InY = -46233.74 - 1.7488InX_1 + 453647.1InX_2 - 1.3950InX_3 + 17.1867InX_4$$

se	12502.67	0.5600	111991.1	8.9753	6.4366
t	-3.6979	-3.1225	4.0507	-0.1554	2.6701

$R^2 = 0.9844 \quad \overline{R}^2 = 0.9741$

$F = 95.0961$

According to the analysis of regression results, $R^2 = 0.9844$,Modified determinability coefficient. $\overline{R}^2 = 0.9741$, It can be seen that the fitting degree of the model is very good. Assuming a significant level of 5%, only X3 (foreign direct investment) partial regression coefficient p0. 8816 > 0. 05 p value is more significant, not satisfied with the significance level, the rest all meet the significance level, their p value is less than 0. 05.And the regression model F95. 0961. there is not a p value of F value greater than or equal to 95.0961 in the model.So we can get the assumption that rejecting all variables at the same time has no effect on foreign exchange reserves.At the same time, it can be seen from the model that each increase in import and export balance of $100 million reduces foreign exchange reserves by $174.88 million. It can be concluded that the relationship between import and export balance and foreign exchange reserves is reversed.With each change of exchange rate, foreign exchange reserves fluctuate by $45.36471 trillion, and the exchange rate has a positive relationship with foreign exchange reserves.With the increase of $100 million in GDP and an increase of $1 billion 718 million 670 thousand in foreign exchange reserves, we can see that there is a positive relationship between the foreign exchange reserve and the good or bad of a country's economy.

3.2 Model checking

Because the regression parameter of FDI is not significantly zero, using likelihood ratio (LR) statistics to check whether the regression coefficient of FDI is equal to zero, the result is shown in figure 2:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-45968.64	11490.07	-4.000729	0.0052
INX1	-1.740873	0.517391	-3.364717	0.0120
INX2	445166.9	90728.43	4.906586	0.0017
INX4	16.54382	4.574677	3.616391	0.0086

R-squared	0.984409	Mean dependent var	27531.87
Adjusted R-squared	0.977727	S.D. dependent var	9140.337
S.E. of regression	1364.117	Akaike info criterion	17.54969
Sum squared resid	13025702	Schwarz criterion	17.69438
Log likelihood	-92.52329	Hannan-Quinn criter.	17.45848
F-statistic	147.3247	Durbin-Watson stat	2.434335
Prob(F-statistic)	0.000001		

Figure 2 results of overall regression analysis

Two results of F test and LR test are given from the output results for the regression coefficient of foreign direct investment (FDI) which is equal to zero.Because the corresponding probability of FDI is 0.8816 > 0.05, it shows that the values of F test and LR test fall in the accepted domain of the original hypothesis [3].The conclusion is that the correlation coefficient of FDI is equal to zero, which shows that the amount of FDI has little effect on foreign exchange reserve, and the effect is not significant.

At the same time, from figure 2, we can see that $R^2 = 0.9844$, the revised determination coefficient is $\overline{R}^2 = 0.9777$ .It shows that the fitting degree is quite good, and there is a strong correlation among the variables,That is, import and export balance, exchange rate, GDP there is a strong correlation.With the increase of import and export balance, the increase of China's foreign exchange reserves is also significant. With the increase of foreign exchange reserves and the enhancement of the ability to pay abroad, people are more willing to hold renminbi in their hands, which directly leads to the appreciation of the renminbi. At the same time, the appreciation of the yuan brought down the prices of imported consumer goods, boosting consumption growth, driving the country's economic growth, and making the gross national product (GDP) rise.

At the same time, according to figure 2, we can see that the value of F=147.3274,F is very large, which shows that the effect of total regression is remarkable, and the absolute value of t value is all greater than 2, and the corresponding p value of the three regression parameters is all less than 0.05. it is concluded that the parameters of the explanatory variable are significantly not zero.Therefore, we can draw a conclusion that the three variables that have significant influence on China's foreign exchange reserve are the import and export difference (IOP), the exchange rate (ERN), the gross national product (GNP), and the GDP (gross national product).the regression model can be obtained:

$$InY = -45968.64 - 1.740873InX_1 + 445166.9InX_2 + 16.5438InX_3$$

4. SUMMARY AND RECOMMENDATIONS

Through the regression analysis of Eviews software, the regression equation of influencing foreign exchange reserve is established, and the main factors influencing China's foreign exchange reserve are determined from the analysis: import and export balance, exchange rate and GDP.With the rapid development of China's economy, the difference between imports and exports will gradually rise, and the GDP will also increase. This is the main reason for the increase in China's foreign exchange reserves. But controlling the exchange rate between the renminbi and the dollar is one of the main ways to slow this surge.China should take reasonable measures to control the amount of foreign exchange reserves and a series of negative effects brought by its sharp increase, which can expand domestic demand, increase multi-exchange investment, and implement a series of related preferential policies for multi-exchange investment. Balance import and export trade and steadily reduce foreign exchange reserves. Zong Qinghou suggested that we must adhere to the principle of reciprocity in the future, to realize the wealth of peer exchange, through the distribution of wealth to the domestic market, the prosperity of the domestic market, and promote the development of the domestic market, the economic growth mode change, to avoid excessive dependence on export growth, exports to encourage imports, to achieve trade balance [4].To expand the use of multi-exchange funds, to maintain the diversification of reserve assets, to reduce the risk of a single excessive amount, to control the exchange rate ratio between the RMB and the US dollar, and to place more foreign exchange demand on domestic economic development and construction. Stimulating domestic economic demand and development.

REFERENCE

[1] Cbiw. China's foreign exchange balance was $3.31 trillion at the end of March 2012. [EB/OL] (2012-04-13) [2012-06-19] http://www.askci,com/news/201204/13/85859-05.sht1.

[2] Yuanwen Chen. An empirical study on the influencing factors of China's Foreign Exchange Reserve [J]. Journal of Shunde Vocational and Technical College, 2012, No. 04: 30-33.

[3] Yun Zhang. Regression Analysis of factors influencing China's Foreign Exchange Reserve [J]. Science and technology economy market, 2013, No. 03: 19-21.

[4] Jing Gao. Balance import and export trade, Reduce foreign exchange reserves [N]. China Business Daily, 2014-3-7 (P04).