

The Exchange Rate of RMB Has Positive Influence to Chinese Stock Prices

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Abstract: After the exchange rate reform on August 11, 2015, the RMB exchange rate has had an increasing impact on my country's stock price. The study of exchange rate changes plays a very important role in stabilizing a country's stock price. This paper first introduces the transmission mechanism of exchange rate to stock prices from three aspects, and then establishes a multiple linear regression equation, using the closing price of the CSI 500 Index and the exchange rate of RMB against the US dollar as the descriptive indicators of the stock price and exchange rate, respectively, and the consumer price Index, producer price index, purchasing manager index, and money supply are used as control variables to empirically test the effect. Finally, the conclusion is drawn that my country's stock price and the RMB exchange rate change in the same direction.

Keywords: Exchange rate, Stock price, Multiple linear regression.

1. Research Background

In 2013, the United States released the signal of quantitative easing to shrink its balance sheet, and the ten-year interest rate in the United States caused the dollar to continue to strengthen, and the public gradually formed the expectation of devaluation of the RMB, which led to a large amount of capital outflow. At the same time, the intervention of the People's Bank of China in the foreign exchange market caused deflation. In order to release the pressure of RMB depreciation, the People's Bank of China announced on August 11, 2015 to adjust the quotation mechanism of the central parity rate of the exchange rate of RMB against the US dollar.

From 2015 to 2016, my country's stock market experienced a large shock from a bull market to a stock market crash. On May 29, 2015, the closing price of the China Securities 500 Index was as high as 9966.84, and the closing point of the CSI 300 Index also reached a new high of 4840.83; The closing price of the 500 index fell to 6123.73, and the closing price of the CSI 300 index also fell to 3202.95. During this period, the management has successively issued: suspending the IPO issuance, securities companies will contribute no less than 120 billion to invest in blue-chip ETFs, and the central bank will provide liquidity to securities and finance companies. During the period, the Ministry of Public Security and the China Securities Regulatory Commission also jointly investigated malicious short-selling activities and made every effort to maintain the normal order of the capital market.

There are many reasons for the stock market volatility, including many factors other than exchange rate and monetary policy, but the tightening effect caused by the inflexible exchange rate increases the probability of the stock market falling.

2. Review of Domestic and Foreign Literature

Dornbusch and Fischer first proposed a flow-oriented model, emphasizing the trade balance, and arguing that the exchange rate unilaterally affects the stock price: exchange

rate changes affect the international competitiveness of enterprises, which are reflected in the cash flow and stock price fluctuations of enterprises.

Branson put forward a stock-oriented model, arguing that stock prices will affect the exchange rate: if a country's stock market rises, international capital will flow into the country's stock market, and the demand for the country's currency will increase, resulting in currency appreciation; at the same time, due to the wealth effect, consumption and investment demand increase, and the demand for the local currency increases, which will also lead to the appreciation of the local currency.

Zhao Fanzhen, Zhang Ting[1] used quadratic regression and Robust regression to explore the impact of exchange rate on my country's stock market, and found that exchange rate fluctuations have a positive relationship with the Shanghai Composite Index, but its correlation is closely related to the industry. Song Ruichao, Sun Tao[2] used the DCC-MGARCH model and the MS-VAR model, using the central parity rate of the USD/RMB exchange rate and the CSI 300 stock index as indicators to measure the Chinese stock market, and found that the exchange rate and stock price during 2011-2020 except 2016-2018. Weak correlation, the rest of the period showed a negative correlation. Feng Jian[3] used the financial crisis and the exchange rate of August 11 to be changed to nodes, and divided the research sample into three sub-intervals. The study found that the impact of exchange rate on the stock market increased significantly after the exchange rate reform in 2015. The VAR model shows that it depends on the import and export industry. Stock indices are more affected by exchange rates than other sectors. Zhu Linfei[4] chose the Shanghai Stock Exchange A Index to measure the situation of my country's stock market, and obtained the conclusion that exchange rate and stock price interacted through empirical analysis. Liu Yang and Yang Kaiwei[5] used Johansen cointegration test and Granger causality test to believe that exchange rate changes have a unilateral positive correlation with the stock market, and the appreciation of the RMB will cause the stock price to fall.

From the research of the above scholars, it can be found that the exchange rate has an impact on the stock price, and

most of them are in line with the flow-oriented model; there are also a few scholars whose empirical results are in line with the stock-oriented model. However, in general, Chinese scholars have not done much research after the exchange rate reform on August 11, 2015, and the existing research lacks analysis of events in the exchange rate market and securities market.

3. The Mechanism of Exchange Rate Impact on Stock Price

3.1. Investor Expectation Transmission Mechanism

Once the financial market is pessimistic or optimistic, many investors will have "herd behavior", which will quickly spread to other financial markets, resulting in "domino effect"[6]. Under the direct quotation method, an increase in the exchange rate means a depreciation of the local currency, that is, a decrease in the purchasing power of the local currency. If the exchange rate correction cannot be realized for a long time, investors in the market will expect the domestic currency to continue to depreciate, and the investor confidence index will drop, which will greatly reduce the funds in the stock market, which will be reflected in the stock price drop. Conversely, when the exchange rate falls, the local currency appreciates, the market will hold positive expectations, and investors will invest money in the stock market, causing stock prices to rise.

3.2. Transmission Mechanism of The Balance of Import and Export Trade

Under the conditions of the opening of the international financial market, changes in the exchange rate of a country will cause differences in domestic and foreign price levels. Driven by the profit-seeking nature of capital, investors will choose the most economical product or service price in the international market, so that the increase in the import of countries with an increase in the exchange rate of their local currency will increase the stock prices of enterprises that depend on imports. The state increases exports, which benefits export-oriented firms, thereby increasing their stock prices.

3.3. Policy Transmission Mechanism

A long-term currency stabilization policy plays a key role in the rise of stock prices, and a stable policy can maintain the stability and healthy development of the financial market[7]. Taking Europe as an example, when the European debt crisis broke out in 2009, the exchange rate of the euro against the dollar fell from 1.500 to 1.430, a drop of about 4.89%. Under

severe economic pressure, EU member states began to take a series of measures to manage the crisis and reshape their international competitiveness, including strengthening financial supervision, improving the financial system, and the European Central Bank's unlimited purchase of government bonds. Thereby effectively slowing down the impact on the securities market.

4. Research Design

4.1. Variable Selection

The independent variable is the RMB exchange rate, and the closing price of the RMB/USD exchange rate under the indirect pricing method is used as the proxy variable for the RMB exchange rate. The purpose is to make the stock price change and the exchange rate change in the same direction, that is, the RMB exchange rate rises, and my country's stock price rises, thereby obtaining a more intuitive results.

The dependent variable is the stock price, and the closing price of the China Securities 500 Index is used as a statistical indicator to reflect the overall stock market in my country. The CSI 500 Index mainly focuses on small-cap stocks in Shanghai and Shenzhen. The sample stocks are all A-shares excluding the CSI 300 constituent stocks and the top 300 stocks in terms of total market value. The index pays too much attention to the financial industry and emphasizes the market share of large companies. It is an index that reflects the overall situation of small and medium-sized companies in the Shanghai and Shenzhen markets. Compared with the CSI 300 Index, it is more representative.

Control variables include consumer price index (CPI), producer price index (PPI), purchasing managers' index (PMI), and money supply (M2).

The above data comes from websites such as Oriental Fortune.com and Sina Finance. Select the monthly data from January 2016 to December 2021, remove the abnormal data, and finally get 71 samples.

4.2. Model Selection

In this paper, a multiple regression model is used to study the impact of exchange rates on stock prices. The specific models are as follows:

$$SCI500 = \alpha_0 + \alpha_1 CNYUSD + \alpha_2 CPI + \alpha_3 PPI + \alpha_4 M2 + \alpha_5 PMI + \mu$$

Among them, the α_0 constant term, $\alpha_1 - \alpha_5$ are the coefficients of each variable, and μ is the random error term.

Using stata16.0 to conduct empirical research, the results of multiple regression are shown in Table 1, Table 2, and Table 3.

5. Results and Analysis

Table 1. Variance analysis

Source	SS	df	MS
Model	21527727.3	5	4305545.46
Residual	20722525.3	65	318808.082
Total	42250252.6	70	603575.037

Table 2. Significance analysis

Number of obs	F(5, 65)	Prob > F	R-squared	Adj R-squared	Root MSE
71	13.51	0.0000	0.5095	0.4718	564.63

Table 3. Regression coefficient test

SCI500	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
CNYUSD	54952.44	16025.01	3.43	0.001	22948.29	86956.6
CPI	-100.9654	80.91045	-1.25	0.217	-262.5547	60.62391
PPI	38.18741	17.55416	2.18	0.033	3.129329	73.2455
M2	.0002834	.0002494	1.14	0.260	-.0002148	.0007815
PMI	219.7796	84.77319	2.59	0.012	50.47587	389.0834
_cons	-7602.64	11695.45	-0.65	0.518	-30960.07	15754.79

As can be seen from Table 3, the control variables CPI and M2 have not passed the test of significance of 0.05, indicating that the correlation between these indicators and the CSI 500 Index is not obvious. The other two control variables have passed the 0.05 significance level test, indicating that the CSI 500 Index has a significant positive correlation with the Producer Price Index and the Purchasing Managers Index. The regression results show that SCI500 and CNYUSD are positively correlated at the 0.01 significant level, that is, the higher the RMB exchange rate, the appreciation of the RMB, and the higher the stock price level in my country. The degree of fit of the model is 0.4718, and the F value of 0.0000 indicates that the model as a whole is significant.

Therefore, the following multiple linear regression model is finally constructed:

$$SCI500 = -7602.64 + 54952.44CNYUSD - 100.9654CPI + 38.18741PPI + 0.002834M2 + 219.7796PMI + \mu$$

6. Conclusions and Recommendations

Through theoretical research and the use of monthly data from January 2016 to December 2021 to establish a multiple regression model, this paper studies the impact of the RMB exchange rate on China's stock price since the exchange rate reform on August 11, and draws the following conclusions: After the exchange rate reform in 2015, my country's The stock price and the RMB exchange rate have a significant co-directional relationship, and the appreciation of the RMB will help drive the stock price up and provide impetus for the development of the securities market.

In this regard, the following suggestions are put forward: First, the central bank should appropriately intervene in the inflow of overseas capital. Before China has established a financial system that can withstand external shocks, intervention in the foreign exchange market can increase the speculative cost of international hot money, thereby reducing the impact on the domestic capital market[8]. Maintaining the relative stability of the exchange rate market can reduce asset price bubbles and play an important role in promoting a country's stock market and even the entire financial market. Second, for investors and listed companies, they can hedge in the futures market to reduce the impact of exchange rate fluctuations on stock prices, thereby effectively reducing the

economic losses caused by sharp declines in stock prices. For example, in anticipation of the expected decline in the future, investors can establish a short position in the futures market, and after receiving foreign exchange to sell in the spot market in the future, they can offset the original futures short position to achieve the purpose of hedging. Third, relevant departments strengthen the supervision of the securities market. At present, my country's stock market supervision is not perfect. A reasonable and effective supervision system can promote the active and healthy development of the stock market and reduce the impact of exchange rate fluctuations.

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