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Empirical Analysis on the Influencing Factors of China's Total Foreign Trade

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Abstract

On the occasion of the 40th anniversary of reform and opening up, China's economic growth level has steadily risen and its international status has gradually improved. However, as the global economic downturn, China is facing tremendous challenges and pressures in the international economic and financial markets. The turbulence of foreign trade and international financial markets has put forward greater requirements for the flexibility of China's financial strategy. Based on the annual data of China's total foreign trade, exchange rate, commodity retail price index and the proportion of tertiary industry from 2002 to 2017, this paper constructs a multiple regression model to analyze the main influencing factors of China's total foreign trade. The empirical results show that there is a positive relationship between the commodities retail price index and the total foreign trade, a negative relationship between the proportion of tertiary industry and the total foreign trade, and a positive relationship between the exchange rate of RMB (taking US dollar as an example) and the total foreign trade. On the basis of empirical analysis, the paper puts forward suggestions on relevant financial policies.

Keywords

Total Foreign Trade, Exchange Rate, Commodity Retail Price Index,
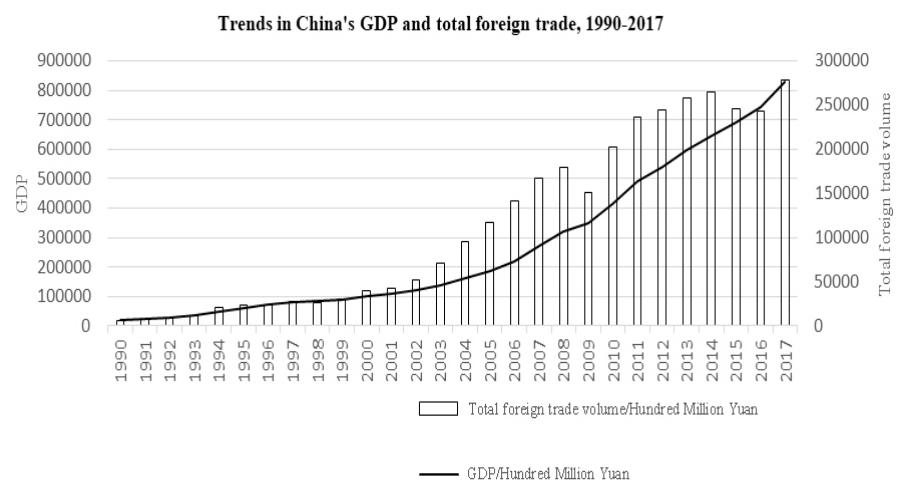The Proportion of Tertiary Industry, Multiple Regression Model

1. Introduction

Total foreign trade is one of the important indicators reflecting the scale of foreign trade and the level of economic development of a country or region. It also plays a great guiding role in our financial policy-making system. At the same time, China is an important product processing base in the world and has made great contributions to global manufacturing exports [1].

In recent years, China's growth has slowed down and entered a new normal state of economic development. According to **Figure 1**, we can see that China's foreign trade volume is on the rise, reflecting from the side that China's foreign trade status is steadily rising, the scale of trade is expanding, and the status of international trade is increasing day by day; China's GDP is increasing year by year, China's economic development is booming, and its national income is increasing. The total foreign trade also shows the same trend of change, and the contribution of export to GDP accounts for a certain proportion [2]. It can be seen that foreign trade plays an important role in China's economy. Therefore, in the face of severe international trade situation and uncertain international economic situation in the future, it is a powerful prerequisite to clarify the factors affecting total foreign trade and carry out accurate policy and strategy implementation to alleviate the adverse impact of Global trade challenges on China's economy, ensure national income and improve people's living standards.

2. Literature Review

Faced with the slow development of Global trade economy, many scholars have been paying attention to the factors affecting foreign trade in recent years. Chen Xiu [3] (2018) took China's export data to other BRICS countries from 2000 to 2017 as samples and used the non-linear model Markov mechanism conversion model to study the impact of exchange rate fluctuations on China's export trade. It was concluded that exchange rate fluctuations had no significant impact on China's export trade in the highly volatile export environment. In the low volatile export environment, exchange rate fluctuations had no significant impact on China's export trade. China's trade exports have a significant negative impact. Xiao Yue [4] (2010) compared the impact of 2010 exchange rate reform with 2005 exchange rate reform on China's trade, and used import and export data to study the effect of RMB exchange rate changes on trade surplus. It was concluded that RMB appreciation had a significant impact on exports, but had no

Figure 1. Trends in China's GDP and total foreign trade, 1990-2017.

significant impact on imports. The diversity of previous conclusions also provides valuable reference for my follow-up study. It also confirms that exchange rate has a complex impact on China's foreign trade. It can affect the choice of export trade itself, and also become a competitive advantage in the development of foreign trade.

Deng Minghui [5] (2018) based on the annual data of China's foreign trade exports from 1997 to 2016, explored the influencing factors of China's export of foreign trade commodities, constructed a multiple regression model, and concluded that the retail price index had a more significant impact on the export volume of trade commodities. Based on the provincial panel data from 2004 to 2015, Yang Fengming [6] (2018) used the vector autoregressive model to study the relationship between financial development, scientific and technological innovation and import and export trade. The level of development and technological innovation can promote import and export trade, and financial development can inhibit import and export trade. The impact of financial development on import and export trade is negative. In the neoclassical trade theory, H-O model holds that countries should concentrate on producing and exporting products that make full use of their abundant factors in exchange for those products that intensively use their scarce factors. It holds that a country should export goods with intensive factors in its own country and import goods with scarce factors in order to achieve the effect of positive game. The Lyontiv paradox is contrary to the former through experiments. Thus, the impact of our industrial structure on China's foreign trade, especially the changes and innovations of import and export factors brought about by the rise and development of China's tertiary industry, exists.

Zhang Xuan [7] (2018) based on China's total import data from 1996 to 2015, and set GDP, total export, savings of urban and rural residents, exchange rate and foreign exchange reserve as explanatory variables, and made regression analysis. It was concluded that an appropriate increase in import volume would help ease the pressure of RMB appreciation, curb inflation and maintain China's import and export balance. At the same time, exchange rate and foreign exchange reserve would be beneficial to China. Imports have a significant impact. Wang Cijun [8] (2018) used the time series model to make an empirical analysis of the five factors affecting China's foreign trade: GDP, the exchange rate of RMB against the US dollar, the actual use of foreign investment, the consumption level of residents and the investment in fixed assets of the whole society. Li Fengbo [9] (2009) selected historical data from 1985 to 2005 to conduct empirical research, and concluded that the growth of imports is closely related to GDP, consumer price index and exchange rate.

Looking at the previous literature, we can see that the main factors affecting the total foreign trade are GDP, consumer price index, exchange rate, industrial structure, etc. At the same time, when studying the tertiary industry, domestic scholars tend to use the relationship between the development of financial services industry and the total foreign trade. The results of the research mostly fo-

cus on the adjustment of international financial policy, which is to our present level. Duan's national conditions are not universal. Therefore, we choose the proportion of tertiary industry, RMB exchange rate (taking US dollar as an example) and commodity retail price index as explanatory variables to analyze the impact on China's foreign trade.

3. Modeling and Empirical Analysis

3.1. Theoretical Hypothesis

The tertiary industry, namely all kinds of service industries, is one of China's economic industrial structure，its proportion can be seen that China's current state of industrial structure upgrading and reform is a major competitive advantage of trade, therefore, we assumes that the proportion of tertiary industry is positively correlated with the total foreign trade; The exchange rate of RMB represents the external value of RMB, and also reflects the international status and strength of our country, we assumes that the exchange rate of RMB is positively correlated with the total foreign trade; The adjustment and change of retail price directly affects the living expenses of urban and rural residents and the national financial revenue, here we assumes that there is a positive correlation between retail price index and total foreign trade.

3.2. Model Building

We use Eviews to construct a multiple linear regression model, using relevant data from China National Bureau of Statistics from 2002 to 2017, taking total foreign trade (Y) as the interpreted variable, tertiary industry proportion ($X2$), RMB exchange rate (USD as an example) ($X3$), commodity retail price index (1978 = 100) ($X4$) as explanatory variables.

Build regression model:

$$Yt = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \mu$$

3.3. Empirical Test

1) Unit root test

Because those datas are time series, the unit root tests of Y, X2, X3 and X4 are carried out, and the following results are obtained: (**Table 1**)

It can be seen that Y, X2, X3 and X4 are first-order monolithic at the same significant level.

2) Cointegration Test

Table 1. Unit root test.

variable	Y	X2	X3	X4
test value	−2.424344	−1.829665	−1.739393	−2.091785
The Critical Value of 10% First Order Difference	−1.604392	−1.604392	−1.604392	−1.604392
stationary or not	yes	yes	yes	yes

In order to judge whether there is a co-integration relationship, the stationarity test of the regression residual series shows that t statistic value is −3.036724, which is less than the critical values, so there is no unit root in the residual series, indicating that those variables have a co-integration relationship, and there is a long-term equilibrium relationship among the four variables.

3) Analysis of Regression Results

Using the principle of least square method, we get the following Equation (1):

$$Y = -873390.3 - 9171.654X2 + 306.4367X3 + 3111.354X4$$

$$t = (-2.834690)(1.618557)(5.300338) \tag{1}$$

$$R^2 = 0.967347; \overline{R}^2 = 0.959183; F = 118.4986; n = 16$$

From Equation (1), we can see that the model fits the sample well，the overall regression effect is remarkable.

From the T value of the coefficient, we can see that the proportion of the tertiary industry and the retail price index of commodities have a significant impact on the total foreign trade, while the RMB exchange rate has a weak significant impact on the total foreign trade.

The model estimates show that, assuming that other variables remain unchanged, the proportion of tertiary industry increases by one unit, the total foreign trade decreases by 9171.654 units; the total foreign trade increases by 306.4367 units with the increase of RMB exchange rate; and the total foreign trade increases by 3111.354 units with the increase of commodity retail price index by 1%.

3.4. Heteroscedasticity Test and Autocorrelation Test

Using White test, we get: nR^2 = 12.69553 and P = 0.1769 > 0.05, so there is no Heteroscedasticity in the model. Using LM test, we get LM = 2.310815, P = 0.3149 > 0.05, and the coefficients of RESID (−1) and RESID (−2) in auxiliary regression were not significant. The P values of corresponding T statistics were greater than 0.05, so there was no autocorrelation in the model.

4. Conclusions and Policy Suggestions

4.1. Conclusions

Through empirical analysis, we draw the following conclusions: commodity retail price index has a positive relationship with the total foreign trade, the proportion of the tertiary industry has a negative relationship with the total foreign trade, and the exchange rate of RMB (taking the US dollar as an example) has a positive relationship with the total foreign trade and a regression relationship.

When the proportion of the tertiary industry increases by one unit, the total foreign trade will decrease by 9171.654 units. According to the vigorous development of China's economy, we can see that the rise of China's tertiary industry has promoted China's net exports to a greater extent, and is more conducive to improving the quality of people's domestic living standards, rather than im-

proving the overall situation of foreign trade. It reflects that the deepening reform of China's foreign trade industrial structure is not complete, the degree of industrial opening to the outside world is not high or the balance of imports and exports is limited. When the RMB exchange rate is increased by one unit, the total foreign trade will increase by 306.4367 units. The RMB exchange rate has a weak significance on the total foreign trade, but this does not mean that we can ignore the impact of the exchange rate. A country's currency has different incentive mechanism for its import and export, but the stability and value of a country's currency exchange rate also reflects a country's economic, political and social stability and development. When the retail price index of commodities rises by 1%, the total foreign trade will increase by 3111.354 units. It can be seen that the rising price level is accompanied by the prosperity of China's foreign trade. The rise of commodity price index not only represents the increase of living expenditure and purchasing power of Chinese residents, but also indicates the change of market supply and demand, thus affecting the tendency of foreign trade in China.

It can be seen that the proportion of tertiary industry has the greatest and negative impact on China's total foreign trade. Therefore, China should take into account the import and export situation of the proportion of tertiary industry, focusing on policy guidance.

4.2. Recommendations

1) Accelerate industrial restructuring and fully develop the financial and information technology industries.

Industrial structure refers to the proportion of agriculture, industry and service industries in a country's economic structure. Reasonable industrial structure is conducive to the development of the whole market. At the same time, perfect economic cooperation is also an important means to greatly promote the vigorous development of all walks of life, stabilize the economy and reduce shocks [10]. Therefore, according to the current situation, China should develop the tertiary industry in a balanced and steady way. While increasing the proportion of the tertiary industry, we should give full play to the financial and information technology industries in the service industry, grasp the current international hot industries and improve the competitiveness in the international market. Let capital go out at the same time as it is introduced, promote economic development in all respects, and realize the economic development goal of our country under the new normal conditions.

2) Improving the mechanism of commodity price early warning and information transmission.

The retail price index of commodities plays a positive role in China's foreign trade and has increasingly become an indicator of residents' consumption tendency. In the face of the global economic turmoil, China should pay more attention to the supervision of domestic trade activities, guard against unfair price fluctuations, broaden the channels of information dissemination and access, give

full play to the role of information in price guidance, make people treat the normal range of price fluctuations rationally, and maintain social stability [11]. To formulate relevant long-term effective measures and implement continuous supervision, while playing a price warning role, reduce government interference costs, better maintain the stability of trade imports and exports, and promote economic development.

3) Stabilize the RMB exchange rate and improve the exchange rate management mechanism.

According to the data obtained in recent years, the scale of China's foreign trade has continued to expand, the volume of foreign exchange transactions has increased [12]. Strengthening the control of RMB exchange rate is conducive to preventing abnormal fluctuations in cross-border capital transactions, stabilizing foreign exchange and capital markets, and avoiding the imbalance of surplus and deficit in China's foreign trade and capital flight caused by speculators. At the same time, we should also take timely and appropriate measures to prevent the impact of international monetary market shocks on China's economy.

4) Improving the ability of independent innovation and reducing the dependence on global trade

In the face of the poor international trade situation and the expected slowdown of global economic growth, China should improve its irreplaceable competitiveness, strengthen innovation in the fields of science, technology and finance, and cultivate the radiation capacity of products in order to stabilize its position in international trade. In order to reduce the impact of Global trade weakness on China's overall economy, we should intensify the innovation of import and export modes of products and trade, optimize the structure of foreign trade and stimulate domestic demand.

Global trade weakness is a global economic downturn trend. China should vigorously develop green industries, build up its own brand advantages, strengthen regional economic cooperation of "one belt and one road", and transform the uncontrollability of global economy into a benign development of regional economic dominance. Promoting and deepening the original regional economic cooperation will transform dependence into cooperation and strengthen China's ability to resist risks in foreign trade.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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