An Empirical Research on the Relationship Between Financial Service Trade and Financial Industry of Shanghai

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Abstract: Based on VAR model, the paper studies the relationship between financial service trade and financial industry of Shanghai through Co-integration theory. The results confirm that the equilibrium relationship between financial service trade and financial industry of Shanghai actually exists in the long term, and the relationship between import in financial service trade and financial industry is more significant. Under the condition of two phases lag, financial industry is the one-way Granger cause of financial service trade of Shanghai. Besides, the mechanism of interactive development is also been analyzed.

Keywords: VAR Model, Co-integration Theory, Interactive Development

1. Introduction

Along with the development of financial reform, China's financial service trade has stepped in the golden period of development. Preparation of Maritime Silk Road and output of Infrastructure Capacity will bring an increase in the export of insurance and other financial service. Besides, it will also create a new growth point for China's financial development.

As the financial center of China, Shanghai is also the core city of economic circle of the Yangtze River Delta, and the development of its financial sector has always been at the forefront across the country, but the amount of financial trade is obviously not a match with the financial status of Shanghai. In 2013, added value of financial industry of Shanghai was 282.3 billion RMB, but the trade volume was only 5.57 billion dollars. That’s 33.96 billion yuan in the conversion to the spot exchange rate at the end of 2013. It’s shown that there’s a huge gap between Shanghai’s financial service trade and financial industry, and the interaction between the trade and finance seems not to be significant, which is bad for the city to seize the opportunity to realize double-linkage development of financial service trade and financial industry.

Therefore, exploring the interaction between financial service trade and financial industry has important practical significance.

Researches related are mainly focused on two directions: one is the study of the interaction between trade in service and service industry, S. L. Wang, Z. B. Hu and Y. Z. Wang, J. Z. Wang respectively use the VAR model and VECM model to carry out empirical analysis on the interaction between trade in service and service industry of China. They both come to conclusions that there’s a stable equilibrium relationship between trade in service and service industry in the long term. But they have a disagreement in the Granger test results [1, 2]. C. H. Pei and Z. Y. Yang find that science and technology innovation, FDI as well as institutional change are the main reason for the fast growth in service industry [3]. The other direction is to study the promotion of trade in service to economic growth, a lot of researches indicate that there’s a stable equilibrium relationship between trade in service and economic growth [4-9].

2. Methodology

Vector Autoregression Model (VAR) is proposed by Christopher Sims, using some lagged variables from all current variables of the model to conduct regression analysis, and promoting the univariate autoregression model to level of the "vector" autoregressive model composed by multivariate time series variables. VAR model is easy to test the existence of stable relationship between each variable of the model for a long term, without the necessity of making preliminary assumption of the endogeneity and exogeneity for variables in the model. It’s an ideal model for cointegration analysis. Therefore, this article conducts empirical analysis on the interaction between Shanghai financial service trade and
According to the theory of Econometrics, all variables must be stationary before regression, or there will be a "fake" or "nonsense" regression. In 1987, Engle and Granger put forward the theory and method of Cointegration. According to that, even some economic variables are non-stationary series, but their linear combinations are likely to be stationary series. The stationary linear combination is known as cointegration equation, and it's interpreted that the long-term stable equilibrium relationship exists between variables. Only variables with the same integration order may have cointegration. Therefore, this paper takes unit root test to all of the variables using ADF method.

### Table 1. ADF Test Results.

| Variable | Test Value | Critical Value | Conclusion |
|----------|------------|----------------|------------|
| FIN      | -2.222039  | -3.828975      | Unstable   |
| EX       | -1.137445  | -3.175352      | Unstable   |
| IM       | -1.316261  | -1.974028      | Unstable   |
| D(FIN,1) | -1.404924  | -3.175352      | Unstable   |
| D(EX,1)  | -3.429202  | -4.008157      | Unstable   |
| D(IM,1)  | -1.481126  | -1.974028      | Unstable   |
| D(FIN,2) | -7.790513  | -3.175352      | Stable     |
| D(EX,2)  | -4.994049  | -1.988198      | Stable     |
| D(IM,2)  | -3.298422  | -1.977738      | Stable     |

Test results show that, there's a unique cointegration equation of the variables of Shanghai's financial service trade and financial industry at the 5% confidence level. The standardized co-integration equation is given through the Eviews6.0 software:

\[
\text{FIN} = 0.349401 \text{EX} + 1.253872 \text{IM}
\] (3)

s.e. (0.02893) (0.03823)
Likelihood Ratio=19.46237

According to the above equation, there's a long-term stable equilibrium relationship between financial service trade and financial industry of Shanghai. In the long run, with the other factors unchanged, when financial trade exports increase by 1%, the financial sector increase by 0.349%. In contrast, with other factors remain unchanged, when financial trade imports increase by 1%, the financial sector increase by 1.254%, which indicates that the interactive relationship between import in financial trade and financial industry is more significant.

### 3.3. Granger Causality Test

Cointegration test results show that there is a long-term stable equilibrium relationship between financial service trade and financial industry of Shanghai. But further examination is needed to test whether causal relationship exists in the equilibrium. This paper conducts the analysis with Granger Causality Test. Under the significance level of 5%, the results are as listed below in table 3.
Table 3. Granger Causality Test Results.

| Hypothesis                  | F Statistics | P Value | Conclusion |
|-----------------------------|--------------|---------|------------|
| EX is not the Granger Cause of FIN | 1.27481      | 0.3372  | Accepted   |
| FIN is not the Granger Cause of EX | 4.82511      | 0.0482  | Rejected   |
| IM is not the Granger Cause of FIN | 0.27955      | 0.7642  | Accepted   |
| FIN is not the Granger Cause of IM | 5.94038      | 0.0310  | Rejected   |
| IM is not the Granger Cause of EX | 2.30136      | 0.1706  | Accepted   |
| EX is not the Granger Cause of IM | 6.87919      | 0.0223  | Rejected   |

The table above shows that FIN is the Granger cause of EX and IM, but neither EX nor IM is the Granger cause of FIN. Besides, EX is the Granger cause of IM. That’s to say, the development of financial industry will promote the development of the financial service trade to a certain extent, however, the adverse effect of financial service trade on financial sector is not significant, and for a period of time, financial trade exports can promote financial trade imports.

3.4. Analysis of Empirical Findings

There’re a few findings in the empirical analysis. Firstly, the interaction between financial service trade and financial industry of Shanghai actually exists. Secondly, the interactive relationship between financial trade import and financial industry is more significant. Thirdly, the development of financial sector is the one-way Granger cause of financial service trade. The findings are consistent with the theoretical study and reality [10-15].

![Figure 1. Financial trade and industry in Shanghai.](source)

Then, what’s the reason behind the appearance? Why financial industry is the one-way Granger cause of financial trade but the latter isn’t the Granger cause of the former one? And why the interactive relationship between financial trade import and financial industry is more significant? The paper also digs out the reason of these questions.

Financial industry is the Granger cause of financial service trade, which is consistent with the traditional trade theory about Trade in Service. According to the theory, service industry is the basis of trade in service, and the development of trade in service is subject to service industry growth, and there’s a strong correlation between them. The empirical studies of Shanghai indicate that the development of financial industry can promote the development of financial service trade indeed, and the driving effects have time-delay. But why financial service trade is not the Granger cause of the financial industry development, what are the reasons?

Studies show that trade in service affect services mainly through three channels: technology spillovers; human capital accumulation and institutional innovation. On the one hand, financial service trade has improved the financial risk control level and management ability of local financial institutions through the technology spillover effect. On the other hand, studying abroad has also promoted the comprehensive quality and professional ability of financial practitioners and through the human capital accumulation effect. Statistics released by the ministry of education service center in China show that business is preferred when Chinese students choose their major. But why financial service trade isn’t the cause of financial industry? Because with the current financial and monetary policies, there are a lot of obstructions for the promoting effect to work, which results in the consequence that financial service trade hasn’t a particularly significant influence on financial industry.

Why the interactive relationship between financial trade import and financial industry is more significant? Back to the components of financial service trade, about 90% is insurance.

![Figure 2. Financial trade in Shanghai.](source)
The structure imbalance of insurance service trade is the reason why the interaction between import of financial service trade and financial industry is more significant. In 2013, Import of insurance service trade reached $4.86 billion, but exports is only $620 million. Along with the rapid development of Shanghai financial industry, the import of insurance trade grows fast, but the volume of export is still less than $1 billion.

Then why is there such a huge gap between export and import of insurance trade? There are two reasons for the rapid growth in import of insurance. One is the increase of trade in goods, and the other one is that foreign companies tend to choose overseas insurance institution or to use foreign currency to pay insurance cost. They do so in the thought of financial system and the need of the partner. By contrast, the export is subject to the economic environment and the degree of opening to the outside world in the insurance industry. Under the current financial system and capital policy, foreign investment in China's capital market has certain obstacles and barriers, export trade has been restricted. In 2008, the outbreak of the global financial crisis led to the sharp down of export of insurance service trade in 2009, and in 2010, the establishment of free trade zone between ASEAN and our China led to the increase of export in financial service.

4. Conclusion

This paper has conducted an empirical study in the relationship between financial service trade and financial industry of Shanghai using VAR model. It’s found that the interaction between financial service trade and financial industry of Shanghai do exist, and the interactive relationship between financial trade import and financial industry is more significant. Besides, the development of financial sector is the one-way Granger cause of financial service trade. The findings are consistent with the reality. It’s also found that the strict financial control is the main reason that financial service trade can’t get a great development in match with the financial development of Shanghai.

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**Figure 3. Trade of Insurance in Shanghai.**

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