Relationship of International Trade in Financial Services and Economic Growth: The Case of China

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Abstract

International financial services, the financial services trade that is conducted through the financial service sectors, play a very important role in a nation economic growth. Especially the modes of cross-border supply and commercial presence have been the new economics growth point. Multiple regression models are built up based on time-series data of financial service trade and economic growth in China, then co-integration test and Granger test are used to analyze their relationship. The results are that there is long-run equilibrium relationship between the two modes of financial service trade, and both of them improve the economics growth. At last, some suggestions are given for the coordinated development of financial service trade and economic growth.

Keywords: International trade in financial services, Economic growth, Balance of payment, Co-integration test, Granger test

1. Introduction

The concept of financial services was begun from Uruguay round of GATT (General Agreement on Tariffs and Trade) in 1986, and was continuous development and improvement in 1988 by Ingo Walter. In 1994, the details were given in ANNEX ON FINANCIAL SERVICES of GATS (General Agreement on Trade in Services), that is, "A financial service is any service of a financial nature offered by a financial service supplier of a Member. Financial services include all insurance and insurance-related services, and all banking and other financial services (excluding insurance). Financial services include the following activities: Insurance and insurance-related services, Banking and other financial services (excluding insurance). A financial service supplier means any natural or juridical person of a Member wishing to supply or supplying financial services but the term financial service supplier does not include a public entity (e.g. a central bank or monetary authority)." According to the related definitions, GATS agreement covers four modes of supply for the delivery of services: Cross-border supply, that is service delivered within the territory of the Member, from the territory of another Member. Consumption abroad is service delivered outside the territory of the Member, in the territory of another Member, to a service consumer of the Member. Commercial presence, that is, Service delivered within the territory of the Member, through the commercial presence of the supplier. Presence of a natural person, which is service delivered within the territory of the Member, with supplier present as a natural person. Service suppliers of the former two are not present within the territory of the member. The last two's are within the territory of the Member.

According to International Trade Statistics Report (2005), the modes of consumption abroad and presence of a

natural person were small shares f the transaction in practice, for respectively 10-15% and 1-2%, while cross-border supply and commercial presence are the main modes, the rate is respectively 35% and 50%. Considering the data availability, the objects in this paper are the two main modes of financial services, that is, cross-border supply and commercial presence. During the literatures, financial services were only looked as one form of trade in services, e.g. Ricard (1988), Kubo (1998) got the conclusion that trade in services would improve the economic growth based on the theories of trade in goods. Heir Samusen verified that trade in services could improve the economic growth based on the theories of economies of scale and imperfect competition. In China, the literatures of financial services and economic growth are also very few, until now only ZHANG Xiaofeng (2009) utilized time-series data to analysis empirically the relationship of international services trade and economic growth, but only for one mode of financial services. The research didn't include commercial presence mode of financial services.

This paper introduces commercial presence mode of trade in financial services, utilizes econometric methods to establish multiple regression model. Then empirical analysis was done with 1997-2008 time-series data of international financial services and economic growth by co-integration test and Granger test. So that it can be test the relationships between international financial services and economic growth, and then improve their development coordinately. Section II is about elaboration of main modes of international financial services and development status. Section III is to establish the empirical analysis model and explain the sample data. Section IV is empirical analysis on the time-series data, and econometric methods, co-integration test and Granger test, are used. Section V is the conclusion of the analysis, and some measurements are given to improve financial services and economic growth to develop healthily and coordinately.

2. Development of international financial services in China

2.1 Cross-border supply mode

Since 1997 "International Balance of Payments" in China has been established promulgated in accordance with the IMF "International Balance of Payments Manual" (fifth edition), in which the insurance services and other financial services are in statistics. Insurance services account is only of life insurance, freight insurance, other direct insurance and reinsurance etc, while other financial services account is only of financial intermediation services charges (e.g. related services charges of letter of credit acceptance, lines of credit, financial leasing and foreign exchange transactions) and the commission of securities. So the data of them could be viewed as the data of cross-border supply mode of international financial services.

According to State Administration of Foreign Exchange, the value of cross-border supply mode has increased from 1572.19 million dollars in 1997 to 20200 million dollars in 2010. The average increasing speed is 40%. Of which, the insurance services revenue increased from 1219.98 million dollars in 1997 to 17500 million dollars in 2010. The average increasing rate is about 30%. At current, the absolute amount of that would not grow quickly in short term because of the strict regulation of capital in China. And because of financial crisis, the value of insurance service in 2009 was decrease compared with those of 2008, shown in Figure 1.

2.2 Commercial presence mode

Financial services with commercial presence mode are not found in "International Balance of Payments". We can use the international assets of banking sectors to describe this mode. Commercial presence mode of banking sectors included the assets of both Chinese banks at abroad and foreign banks in China. In 2010, foreign direct investment in financial sectors is17.4 billion dollars increasing at 29.13%, the average capital adequacy ratio of which is 18.98%. However, direct investment abroad is 0.0302 billion dollars, which about 70% is the subsidiaries and overseas branches. So there is development disequilibrium in financial services with commercial presence mode in China. It is surplus, and it is also reflected the restriction in capital and financial account of balance of payment.

The other two modes, consumption abroad and presence of a natural person, were account for very few shares in the world transactions, and consideration of their difficulty in statistics, so in this paper they are not included in our study.

3. Models and samples

The sample data are from China Statistical Yearbook, China International Balance of Payments and China Finance Yearbook of 1997-2008. The model is established as in

$$GDP = A(NM)^{\alpha}(FI)^{\beta} \tag{1}$$

Here, A is the constant. GDP indicated that economic growth level. NM indicated net import volume of

cross-border supply mode of international financial services. *FI* is commercial presence mode. Because of data limitations, here is capital volume utilized by the financial institutions.

Logarithmic both ends of equation respectively, which does not change the co-integration relationship between variables, and also make it linear for eliminating heteroscedasticity of time-series data. So after natural logarithmic *GDP*, *NM* and *FI*, the transformation variables are *LNGDP*, *LNNM* and *LNFI*. The new equation as in

$$LNGDP = LNA + \alpha LNNM + \beta LNFI \qquad (2)$$

All of *LNGDP*, *LNNM* and *LNFI* have a growing trend and directions of changes are consistent, shown in Figure 2. Therefore, certain common trends can be judged among them. Unit root test could be conducted to avoid spurious regression problem of time series data. Empirical analysis can be done with the sample through the software of Eviews3.1. First unit root test is conduct to determine the stable data, and co-integration test is done to demonstrate its long-term equilibrium relationship, at last Granger test is done to verify the cause and effect relationship between variables.

4. Empirical test and data analysis

4.1 Unit root test

Because the data in the paper is time-series data, in which dynamic path not only contains predictable elements but also random elements. So it can generate unit root easily. If with no unit root test on it, spurious regression would be produced. Augment Dickey-Fuller (ADF) test method was put forward by Dickey and Fuller in 1981 always used to avoid spurious regression in time-series data. We use the following model of ADF method to test the variables stable.

$$y_t = \alpha + \beta_t + \gamma \ y_{t-1} + \sum_{i=1}^{p} \varphi_i \Delta y_{t-i} + \varepsilon_t \qquad (3)$$

Here, $\Delta y_t = y_t - y_{t-1}$, α is constant, t is time trend item, ε_t is residual item (that is random disturbance).

Testing unit root of constant, time trend and residual items can be conducted based on whether parameters of α, β and γ are zero hypotheses. The *p* is the number of lagged entry, which in (3) is in order to make

residual item, ε_t, and white-noise sequence. Optimal lag length of *p* is determined by Akaike information

criterion (AIC) and Schwarz Criterion (SC), the smallest is the lag order. ADF statistics distribution is non-standard, so Mackinnon critical value is used to determine.

LNGDP, *LNNM* and *LNFI* are made unit root test, ADF test result with Eviews3.1 is shown in Table 1. From Table 1 we know that *LNGDP*, *LNNM* and *LNFI* are not stable but their first order differentials are stable. So co-integration and regression analysis can be conducted. Correlations of *LNGDP*, *LNNM* and *LNFI* can be calculated further with Eviews3.1. Shown in Table 2, correlations of all are above 0.87. Until now the specific relationship of them are not demonstration, so co-integration test and Granger test would be continued in the followings.

4.2 Co-integration test

Co-integration test can determine the long time relationship of variables. Engle and Granger gave the method of co-integration test in 1987. Here we use the test method of Johansen and Juselius that is based on regression correlation. Because the model based on Johansen-Juselius method is very sensitive to lag period, we can get the optimal lag period based on AIC and SC of non-binding model. When there are conflicts between AIC and the SC, likelihood ratio is used to determine the lag order. The output result of Eviews3.1 is shown in Table 3.

According to the result in Table 3, co-integration relationship exists between variables at the significant level of 5%, that is, there is a long-term stable relationship between GDP and international financial services. After regression analysis with (2), regression equation is gotten as in,

$$LNGDP = 3.047366664 + 0.3292177064 \times LNNM + 0.3496246167 \times LNFI \qquad (4)$$

t= (9.438036)   (4.551286)   (3.511323)

R^2= 0.966810   Adjusted-R^2=0.959434   DW=1.867559

So if cross-border supply of financial services increases 1%, economic growth will be lead to 0.33% increasing. And 1% increasing in commercial presence mode will lead to0.35% in economic growth.

4.3 Granger Test

Granger gave the test in 1969. Granger cause test's main contents are that when y is regressed with other variables (including its own past values), if the lagged value of x included can significantly improve the prediction y, x is Granger cause y. According to AIC each variable lag order can be determined. Table 4 is the pairs of variables Granger causality test results.

From the result we know LNNM, LNFI is single Granger cause of LNGDP respectively, and there is Granger cause between LNFI and LNNM.

5. Conclusion

Firstly, it is unstable of relationship between international financial service and economic growth, while their first order differentials are stable. There is a long-term equilibrium relationship between them, in which each variable interacts through long-term equilibrium relationship.

Secondly, according to regression equation, international financial services have a positive correlation effects on economic growth. 1% increasing in cross-border supply will lead to 0.33% increasing in economic growth, while the commercial presence mode increasing 1% will lead to economic growth 0.35%.

Thirdly, the two modes of international financial services are the cause of GDP growth. They can promote mutually, and there is reciprocal causation.

In summary, international financial services are important in the development of world economy and finance. In practice, there more than 90% actions are the international financial services. But the contribution has not been fully revealed to China's economic growth. So it is significant to improve the financial system and maximize financial services liberalization in order to improve international financial services development and cultivate new economic growth point in China.

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Table 1. Augmented dickey-fuller test result

Variable	ADF Test value	5% Critical Value	Result
LNGDP	0.359434	-3.9271	Not stable
D(LNGDP)	-5.15696	-3.9948	Stable
LNNC	0.359434	-3.9271	Not stable
D(LNNC)	-5.15696	-3.9948	Stable
LNFI	-2.176560	-3.9271	Not stable
D(LNFI)	-5.296628	-3.9948	Stable

D indicated the variable is first-order differential

Table 2. Correlation of LGDP, LMN and LFI

LNGDP	LNNM	LNFI	LNGDP
LNGDP	1.000000	0.959865	0.943621
LNNM	0.959865	1.000000	0.875884
LNFI	0.943621	0.875884	1.000000

Table 3. Co-integration test result

Hypothesis	Eigenvalue	Likelihood Ratio	5% Critical Value	1% Critical Value	Result
r=0	0.800686	35.63278	29.68	35.65	Null *
r≤1	0.634511	17.89118	15.41	20.04	At most 1 *
r≤2	0.462029	6.819465	3.76	6.65	At most 2 **

*(**) indicated rejection of hypothesis at the significant level of 5% (1%)

Table 4. Pair wise granger causality tests

Null hypothesis	F-Statistic	Probability
LNNM does not Granger Cause LNGDP	0.18931	0.83320
LNGDP does not Granger Cause LNNM	18.5902	0.00484
LNFI does not Granger Cause LNGDP	0.39243	0.69453
LNGDP does not Granger Cause LNFI	12.5492	0.01125
LNFI does not Granger Cause LNNM	2.29954	0.19582
LNNM does not Granger Cause LNFI	2.04452	0.22446
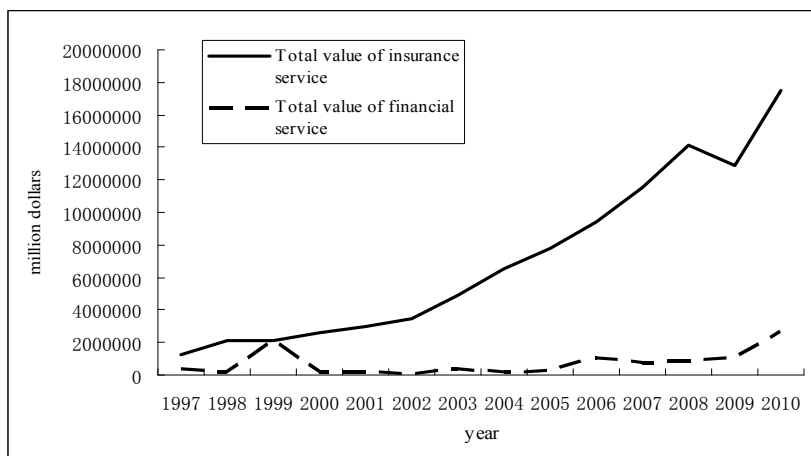
Figure 1. Total Value of Insurance Service and Financial Service Based on Balance of Payment
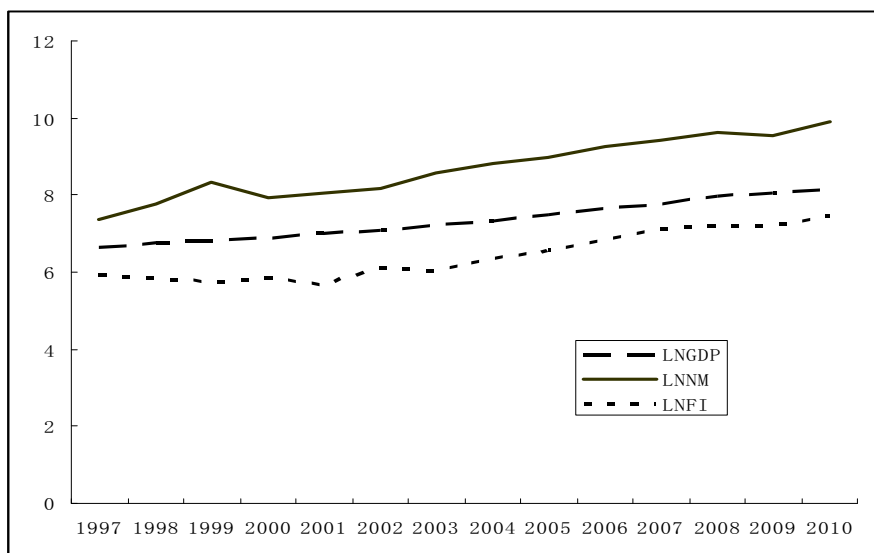
Figure 2. *LNGDP*, *LNNM*, *LNFI* Development Trend