ISSN : 0974 - 7435 Volume 10 Issue 9

2014

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(9), 2014 [4120-4126]

Study on the dependence relationship between real estate industry and financial development in China—Empirical research based on granger causality method

Qiu Shubing Zhou Xiao-Hong

College of Management Engineering, Anhui Polytechnic University, Anhui Wuhu 241000, (CHINA)

ABSTRACT

According to the development of Chinese real estate industry, the two-way dependence relationship between economic growth of real estate industry and financial development in China is studied by the testing methods of co-integration analysis and Granger causality. It is shown that there is co-integration relationship and one-way causation between Chinese real estate industry and financial development. In other words, financial development is the Granger reason of economic growth of Chinese real estate industry. Meanwhile, the economic growth of Chinese real estate industry doesn't have an obvious positive effect on financial development.

KEYWORDS

Real estate industry; Finance; Co-integration analysis; Stationary test; Granger analysis.

© Trade Science Inc.

RESEARCH STATUS

Large previous capital expenses are required in real estate industry which has obvious characteristics as a capital concentrated industry and is closely related to financial development. As for finance, it is considered as the core of modern economy, as well as the "credit intermediary" of fund operation. In the current relevant literatures, there are relatively less studies about the dependence relationship between the real estate industry and financial development. From the perspective of research contents, most studies are mainly about the financial development and its influence relation. As for the study levels, the existing literature studies are for the most part concentrated in macroscopic and regional angles. For example, Allen, F. and D. Gale (1994)[1] have analyzed the risks issues of financial intermediary. Their research suggested that finance is the requirement of macroscopic industrial development. In addition, they put forward: the integration of industry and finance is a double-edged sword; financial risks will spread easily through the capital flow chain, thus to invade the real economy, eventually growing into a systematic risk; Hugh T. Patrick (1996)[2] analyzed from two aspects: supply-oriented and demand-following. And he believed that financial development is attached to the economic growth in macroscopic industries; Aizcorbe (2003)[3] considered that the period (T_1) of relatively fast economic growth in macroscopic industries basically coincides with the period (T_2) of financial development expansion based on the analysis of American macroeconomic data. Additionally, in domestic studies, Tan Ruyong (1999)[4] studied on the relationship between financial development and the economic growth in macroscopic industries: there is remarkable positive correlation between economic growth in macroscopic industries and financial development. And Tan Yanzhi (2003)[5], to study on the relationship between financial development and economic growth in macroscopic industries from 1978 to 2001 in China, then believed that financial development doesn't make a significant contribution to the improvement of economy growth quality of macroscopic industries. In other words, financial development doesn't obviously influence the improvement of the economy growth level in macroscopic industries.

Additionally, from the perspective of research method, the most current studies about the relationship between financial development and industrial economy growth mainly adopt linear regression method, impulse response function method, grey correlation utility analysis method, etc.[6]. In the process of these studies, correlation function relation among factors is emphasized while the analysis of the dependencies between cause and effect among factors is ignored. Therefore,the correct feasible guidance will not be provided for the macroscopic industry development. For that reason, to consider the economic growth status of Chinese real estate industry as the object of study, this paper will make research on the dependence relationship between economic growth of real estate industry and financial development by employing co-integration analysis, granger causality test, so as to provide some relevant theoretical guidance for the healthy and sustainable development of Chinese real estate industry.

DESCRIPTIVE STATISTICAL ANALYSIS OF MACROECONOMIC DEVELOPMENT OF CHINESE REAL ESTATE INDUSTRY

To adopt the index of the added value of real estate industry to describe the macroeconomic development status of Chinese real estate industry. Based on the descriptive analysis on the relevant data of statistical yearbook from 1995 to 2013, the results are as shown in figure 1 (The vertical axis represents the added value of real estate industry; the horizontal axis represents time 1995-2013).

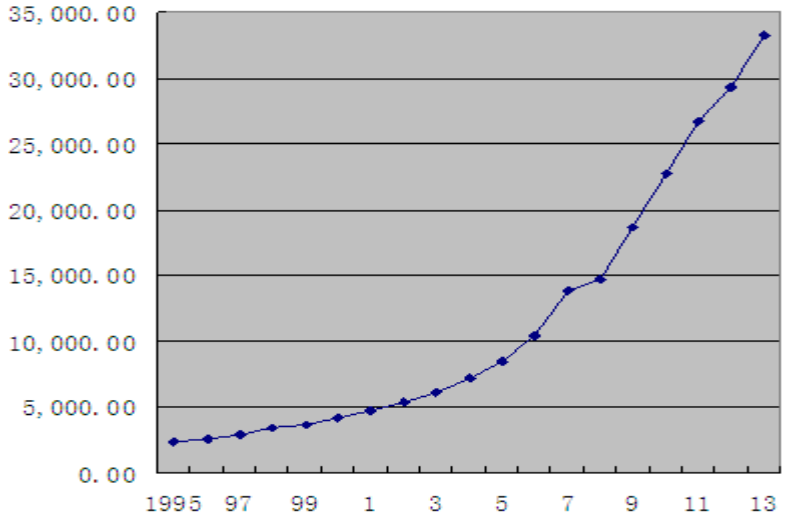

Figure 1 : Analysis chart of development tendency in Chinese real estate industry

As is shown in Figure 1, since 1995, Chinese real estate industry has enjoyed a sustained boom. From the perspective of growth trend, it can be generally divided into four stages. Its variation trend curves was basically synchronous with Chinese macroeconomic development. Before 2005, China had low urbanization developing level; meanwhile, real estate development was relatively slow and steady. From 2005 to 2008, there was the first boom. From 2008 to 2009, affected by American financial crisis, the real estate industry entered the first dormant phase of adjustment. After 2009, the largest increase (include the retaliatory increase after earlier dormant phase) in the history of real estate industry was created owing to the state investment plan of 4 billion and stimulus policies of government bailout. At present, restrictive policies including tight-money policies have been promoted to control the real estate industry. However, influenced by high expectations in the preliminary market, the tendency for this industry to turn and adjust is not obvious enough.

Form 1 : Stages analysis in development of Chinese real estate market since 1995

Development Stage	Stage 1	Stage 2	Stage 2	Stage 4
Time interval	Before 2005	2005 to 2008	2008 to 009	2009 to now

DESCRIPTIVE STATISTICAL ANALYSIS OF DEVELOPMENT OF CHINESE FINANCIAL INDUSTRY

Considering the availability and comparability of the index, to adopt the index of the added value of financial industry to describe the macroeconomic development situation of Chinese financial industry. Based on the descriptive analysis on the relevant data of statistical yearbook from 1995 to 2013, the results are as shown in figure 2 (The vertical axis represents the added value of financial industry; the horizontal axis represents time,1995-2013).

As is shown in figure 2, before 2005, Chinese financial industry has enjoyed basically stable development tendency with relatively gentle speed of development. After the acceleration of this industry in 2005, there was a rising development tendency. However, the developing intensity was not so strong (that is, the curve of the period from 2005 to 2008 is U-shaped, and the tangent line is below the U-shaped curve). From 2008 to now, there has been strong rising development. That is mainly because quantitative easing policies have been promoted by the government in order to cope with the global American financial crisis; additionally, financial industry has formed a pattern of increasingly rising currently, owing to prominent effects of Chinese financial reform in recent years.

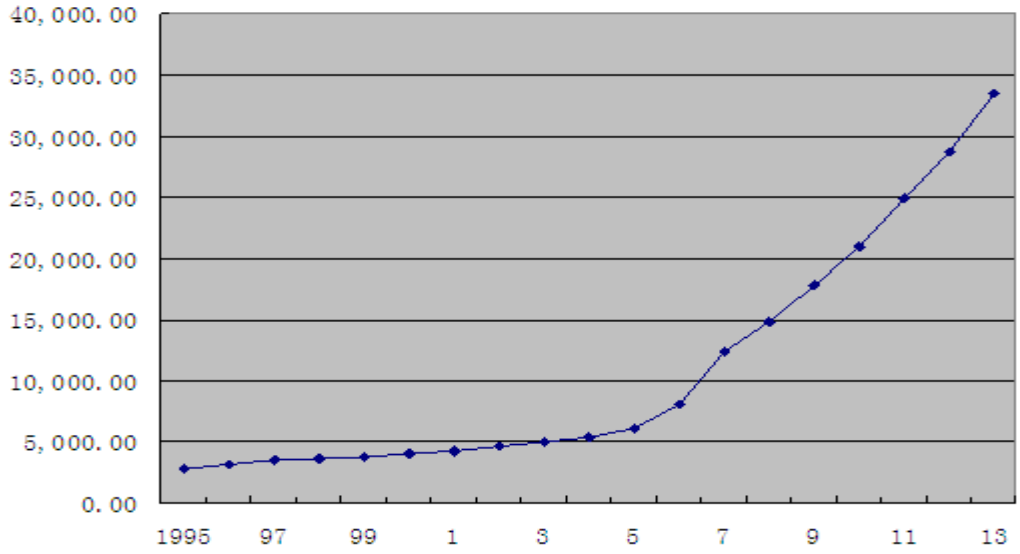

Figure 2 : Analysis chart of development tendency in Chinese financial industry

RESEARCH METHOD AND DATA COLLECTION

Research methods

After the overall consideration of representativeness and availability of the research indexes, industrial added value V_0 is selected as the index of economic growth of Chinese real estate industry; financial intermediary rate V_2 (the computing method: broad money M2/GDP, an index reflecting financial development level and degrees of perfection) is selected as the index of financial development. In order to strip out the impact of price factor, V_0 is adjusted by PCE deflator method, and the tendency of two variables is linearized by taking the logarithm (natural logarithmic transformation will not change the original co-integration relationship among variables), so as to lower the influence of heteroscedasticity.

Research data sources

According to China statistical yearbook, adopting relevant statistical data from 1995 to 2013,and combining some relevant indexes, including the added value of real estate industry, broad money amounts, inflation rate, etc. then the following indexes can be calculated: V_1 after stripping out the impact of price factor (that is to calculate by PCE deflator, $V_1=V_0/CPI$), financial intermediary rate, LV_1 (V_1 with natural logarithm), LV_2 (V_2 with natural logarithm), etc.

EMPIRICAL RESEARCH

Stationary test analysis (unit root test)

In order to perform co-integration test on data, first the presence of non-stationary and unit root should be verified in the time sequence. Here, unit root test on LV_1 and LV_2 will be performed at first by using ADF method. After confirming the orders of each time sequence, the test results are as shown in Form 2 (c represents constant term; t represents trend term; k represents lag phase).

From Form 2, it can be seen that the original sequence of V_1 and V_2 sequence is non-stationary sequence; and the first-order difference sequence is non-stationary sequence; then the second-order difference sequence is stationary sequence. It is thus obvious that both LV_1 and LV_2 are second-order integrated sequence; that is, it satisfies the precondition of co-integration test.

Form 2 : Stationary test on sequence of different variables

Variable	Test type (c.t.k)	ADF statistical quantity	5% critical value	10% critical value	Test result
L V_1	(c.t.1)	-1.5643	-3.0656	-2.6733	non-stationary
First-order difference of LV_1	(c.t.1)	-2.2667	-3.0810	-2.6814	non-stationary
Second-order difference of LV_1	(c.t.0)	-2.2966046	-1.9661	-1.6049	Stationary
LV_2	(c.t.1)	-1.3877	-3.0656	-2.6733	non-stationary
First-order difference of LV_2	(c.t.1)	-2.2980	-3.0656	-2.6733	non-stationary
Second-order difference of LV_2	(c.t.0)	-4.1371	-1.9661	-1.6049	Stationary

Co-integration test analysis

Hereby, E-G two-step method is selected, and co-integration regression analysis on LV_1 and LV_2 is performed by combining with least square method. Meanwhile, stationary test is performed on the residual error gained after co-integration regression. If the residual sequence is stationary, the co-integration relationship exists; if the residual sequence is non-stationary, the co-integration relationship doesn't exist; stationary test results of residual sequence are as shown in Form 3.

As is shown in the results: if the residual ADF statistical quantity is below the critical value of significance level 5%, the residual sequence will be considered as stationary, and there is no roots of unity, and there is co-integration relationship between $LV_1$and LV_2 (there is stationary equilibrium relationship between these two variables).

Form 3 : R_m stationary test results of residual sequence

Variable	Test type	ADF statistical quantity	5% critical value	10% critical value	Test results
R_m	(0.0.1)	-3.5326	-1.9660	-1.6065	Stationary

Granger causality test analysis

Co-integration test analysis could only explain the problem that "whether there is stationary equilibrium relationship between variables", and the causal existence between variables could not be revealed. What's more, the problem between $LV_1$and LV_2 could not be explained: which one promotes the growth of anther one, LV_2 or LV_1? Therefore, in order to study the dependence causality between $LV_1$and LV_2, Granger causality method should be adopted for further test analysis.

Form 4 : Test results of Granger causality among variables

lag phase k	Original assumption	Sample size	F-test	Adjoint probability	Test results
3	Assumption1: $LV_1$is not the Granger cause of LV_2.	18	2.6420	0.1397	Receive
	Assumption2: LV_2 is not the Granger cause of LV_1.		8.8335	0.0087	Refuse

According to fundamental principles of Granger causality test, if variable LV_1 is the reason for the changes of variable LV_2, add the lagged variable of LV_1 as the explanatory variable, which is expected to enhance the explanatory ability of the regression model, that is, variable LV_1 is the reason for the changes of variable LV_2; if the explanatory ability of the regression model could not be enhanced after adding the lagged variable of LV_1, it is called against the original assumption, that is variable LV_1

is not the reason for the changes of variable LV_2. AIC and SC methods are selected in this paper, using the statistical software Eviews, choosing minimum principle, performing significant judgment by log-likelihood estimated value, the optimal lag length is calculated as 3 phases. The test results are as shown in the Form 4. From the computed results, receiving a ssumption1, that is, LV_1 is not the Granger cause of variable LV_2. The development of real estate industry will not increase the financial development level while financial development will promote the development of real estate industry. There is a unidirectional causal relationship between these two. Real estate industry has high degree of dependence on financial development, that is, LV_2 is the Granger cause of variable LV_1. In short, financial development has more obvious influence on the development of real estate industry, and in recent years, the real estate craze hasn't effectively driven the increase of financial development level.

THE MEASURES TO PROPERLY HANDLE THE DEPENDENCE RELATIONSHIP BETWEEN THE REAL ESTATE INDUSTRY AND FINANCIAL DEVELOPMENT

Currently, most Chinese real estate agents are not large in scale, and there are few listed companies. Hence, it is certain that in the future several years, the main source of most capital of real estate agents will still be the traditional banking industry. In order to realize collaborative progress and interaction development of real estate industry and financial development, so as to reduce the financial risks, the following aspects should be paid attention:

To actively encourage the development of non-bank financial organization

At present, after years of market-oriented reform in China's financial industry, market competition consciousness has rose widely. However, Chinese financial industry still stick to the business model of separately operating and regulating four industries including bank, securities, trust, insurance. In addition, the majority of superior resources are still concentrated in the four state-owned banks, and the characteristic of "state-owned" background in banking industry is still very obvious. Currently, stage characteristics of development and financial industry environment of Chinese real estate industry determine that the main source of real estate capital could only be the traditional "state-owned" banks. In other words, there is the situation of obvious unidirectional dependence of real estate industry on the financial industry. In the future development process, industry permitting should be properly opened according to principles of marketization and efficiency comes first, thus to develop small and medium private banks. On the other hand, the synergetic development of industries of securities, trust, insurance should be positively promoted, further to standardize private lending, so as to widen the financing channels and range of real estate industry, thus to reduce the unidirectional dependence degree of real estate industry on the finance industry.

Continue to tighten up monetary policy and limit the monetary mobility

As for the domestic real estate industry, "limit the growth of the money supply" directly influences on the credit market of real estate industry, and effectively restricts the real estate credit, thus to increase the financing threshold of property developers. In this way, especially the small and medium real estate agents will be more likely to face the situation of liquidity shortage or break fund chain, so as to narrow the financing channels of small and medium enterprises, and the degree of their dependence on banking and finance industry will become higher. The measure to continue to tighten monetary policy will certainly narrow the capital sources of real estate market. The aim is to "reversely force" developers to continuously expand financing channels, thus to decentralize the financial risks.

Capital intensive industries in real estate industry have more prominent features. The current financing threshold increases constantly, so that small and medium-sized enterprises without land reserves and financial strength will face the crisis of survival. Under the crowding out effect, a new round of mergers and acquisitions is imperative. In addition, China's current real estate bubble has been formed. Economic strength gap between the various developers is obvious and merger and competition situation between real estate enterprises appears. In the future, there will be a number of land agents of small scale, weak strength and operating difficulties quitting or being acquired, which can achieve the

concentration of effectively realizing resources, namely, the enterprises of small scale and low anti-risk ability will be "crowded out". This can effectively reduce the risk of financial bad debts.

Further standardize the presale system in real estate industry

The government should respect the regulation of marketing competition, encourage some substantial real estate business bigger and stronger to further standardize and improve the real estate pre-sale requirements, and appropriately reduce the forward delivery housing transaction volume, increase transactions of ready houses. Although it causes financial pressure on parts of the land agents, but it can reduce bankruptcy or leave from unfinished rate on the land agents and protect the interests of consumers. It also avoids social conflicts between consumers and land agents and between consumers and local government, which is caused by the bankruptcy on land agents. At the same time, it can increase the rate of down payments regionally and conditionally, reduce expected credit risk and improve social benefits.

CONCLUSION

According to capital-intensive industrial characteristics of real estate industry, combining the conditions of Chinese real estate industry with that of financial development, the dependence relationship between Chinese real estate industry and financial development is studied, and the influence relation model between them is established, the results show that: financial industry has a significant impact on real estate industry while the real estate industry doesn't have obvious positive impacts on financial development. Therefore, in order to reduce the financial risks. It should be realized that in the current domestic real estate development there is the condition "few large enterprises, many small enterprises, few listed companies, strong dependence on traditional banking business, single fundraising channel of most real estate agents", insist in the market rule of "efficiency and survival of the fittest", encourage the annexation and reorganization among real estate agents, so as to further standardize presale system, thus to reduce market subprime credit risks.

Meanwhile, about the problems how to make strategies of "different regions and different conditions", how to scientifically set the rate of down payments for customers, due to space constraints, these will be discussed in a separate paper.

REFERENCES

[1] F.Allen, D.Gale; Financial Innovation And Risk Sharing［M], Cambridge, MA : MIT Press, **(1994).**

[2] Wang Shuguan; Financial Development Theory［M］, Beijing: Chinese Development Press, (**2010).**

[3] Ana M.Aizcorbe, Arthur B.Kennickell, Kevin B.Moore; Recent Change in U.S.Family Finances, Evidence from the 1998 and 2001 Survey of Consumer Finances [J], Federal Reserve Bulletin, **6**, **(2003).**

[4] Tan Ruyong; Empirical Research on the Relationship between Chinese Financial Development and Economic Growth [J], Economic Research, **10**, 53-61 **(1999).**

[5] Tan Yanzhi; Factor Analysis on Financial Development and Economic Growth [J], Shanghai Economic Research, **10**, 3-12 **(2003).**

[6] Zhang Tongyao; Correlative Mechanism of Real Estate Bubble and Financial Crisis and Its Enlightenment to China [J], Economic Review, **6**, 61-63 **(2009).**