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THE IMPACT OF FOREIGN DIRECT INVESTMENT ON CHINA: AN EMPIRICAL ANALYSIS BASED ON THE CHINESE REAL ESTATE SECTOR

By

Linlin Liu

B.A., NANKAI University, 2009

A Research Paper

Submitted in Partial Fulfillment of the Requirements for the

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Department of Economics

in the Graduate School

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RESEARCH PAPER APPROVAL

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Approved by:

Dr. Scott Gilbert

Graduate School
Southern Illinois University Carbondale

April 14, 2011

AN ABSTRACT OF THE RESEARCH PAPER OF

LINLIN LIU, for the Master of Science degree in Economics, at Southern Illinois University Carbondale.

TITLE: THE IMPACT OF FOREIGN DIRECT INVESTMENT ON CHINA: AN EMPIRICAL ANALYSIS BASED ON THE CHINESE REAL ESTATE SECTOR

MAJOR PROFESSOR: DR. Scott Gilbert

As China becomes the world's second largest economy, it is among the top positions as an FDI destination. FDI inflows in China have grown dramatically in the last thirty years, from 1258 million dollars in 1984 to 90033 million dollars in 2009. Along with China's growing real estate market, FDI inflows to the real estate sector have also increased by more than 200 percent in the last decade. In recent years, the price of commercialized buildings in major cities increased tremendously which arouses concern of bubble in the real estate industry in China. This paper explores the impact of FDI on the real estate sector in China using the OLS method and granger causality test. Evidence found in this study suggests that a 1% increase in the growth rate of the utilized FDI will bring about 0.55% increase in the growth rate of the average selling price of commercialized buildings and nearly 93% of the variation in the latter can be explained by the former variable. The results of granger causality test suggest that the causality runs from the utilized FDI to the average selling prices of commercialized buildings. The policy implication from our analysis is that regulations should be implemented in controlling the amount of FDI in the real estate sector and guidance should be provided in directing the sector distribution of FDI.

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CHAPTER 1

Introduction

China is the world's fastest-growing major economy, with an average growth rate of 10% for the past 30 years. As China's economy is growing stronger, the FDI inflows were more than doubled in the last decade and FDI has played an important role in the country's economic development and institutional reform. After the Housing Reform in 1998, the property prices in China have experienced rapid growth. In recent years, the speed of the growth in property prices in China exceeded that in the United States and United Kingdom and the bubble in the real estate sector in China has aroused more attention than ever. Speculation, unrealistic attitudes and easy credit are reasons why China's property market bubble might burst in the future. In Japan at the end of the 1980s and in the United States in 2008, residential real estate bubbles ended in recession. With China acting as a key engine of global growth, a bursting of the Chinese real estate bubble could trigger a larger crisis.

Many factors may contribute to the heated real estate market, and foreign direct investment is one of them. The Chinese real estate market is particularly interesting for many international investors, because it is relatively young which gives early investors many opportunities. Moreover, the real estate conditions under the process of changing are increasing the attractiveness for real estate investments in China.

At the same time, there are some problems with the distribution of the FDI in real estate industry in China. Foreign direct investment in real estate industry in China has been disproportionately agglomerated on the east coast, and first tier cities such as

Beijing, Shanghai, Shenzhen, and Guangzhou which are already highly developed economically have attracted the majority of investment capital. The property prices in these major cities are therefore driven up and effective measures are needed to be taken to balance the market.

Although there have been many studies on the impact of FDI on the real estate sector in China, such as Dianchun Jiang, Jean Jinghan Chen and David Isaac(1998), Stèphane Dees (1998) etc. none of them incorporate FDI with the high property price in China; and the issue of real estate bubble facing China today is more serious than ever.

The paper proceeds as follows: chapter 2 presents a literature review. In chapter 3, I introduce the overview of the impact of Foreign Direct Investment (FDI) on China and the property price movement in China. In chapter 4 I explain the methodology and empirical results of the study. Chapter 5 presents the conclusion and policy implications.

CHAPTER 2

Literature Review

A number of empirical studies have investigated the effect of foreign direct investment on economic growth and the determinants of FDI in China, as well as the FDI contribution to the total factor productivity.

E. Borensztein, J. De Gregorio and J-W. Lee(1998) tested the effect of foreign direct investment on economic growth in a cross-country regression framework, utilizing data on FDI flows from industrial countries to 69 developing countries over the last two decades. Their results suggest that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy.

Dianchun Jiang, Jean Jinghan Chen and David Isaac(1998) studied the development of real estate industry in China and argued that even though Hayek's theory of economic fluctuations can help to explain the contraction of the real estate market in 1994 in China as a whole, it is no longer robust when applied to cities where there is heavy foreign direct investment. It is the foreign direct investment that is making the real estate industry perform well.

Stèphane Dees (1998) assessed the determinants of Foreign Direct Investment in China and its effects on the whole economy. An empirical study was implemented and supported the view that FDI affects China's growth through the diffusion of ideas. Through the introduction of new ideas, multinational firms develop technical progress

and hence long-run economic growth. The transmission of ideas seems to have had a positive effect on the Chinese growth.

Edward M. Graham and Erika Wada (2001) applied an econometric test of whether FDI in China has contributed to increased total factor productivity growth in those provinces that have received large amounts of FDI. The tests suggested that the result is positive, and hence that FDI has contributed significantly to economic growth in China beyond that which results from faster capital accumulation.

Guoqiang Long (2005) evaluated FDI's impact in China and the effectiveness of China's policies governing FDI with regard to export trade and technological advancement. The author also evaluated the influence exerted by FDI policies upon export performance requirements and evaluated the effectiveness of technological performance requirements.

CHAPTER 3

Overview of the impact of Foreign Direct Investment on China

1. Development of FDI in China

Over the past decade, China has established itself as the top recipient of foreign direct investment among developing countries. In 2009, Actually Utilized FDI in China reached $90 billion - corresponding to a 98.9% rise from 1997. The reasons for these huge foreign capital inflows and their impact on the Chinese economy have given rise to an important body of literature. Such rapid growth of FDI inflows in China is attributable to several factors. The low cost of production such as cheap land and blue-collar workers, the abundance of labor, the low taxes for high-technology companies, the role of the overseas Chinese investors from Hong Kong, Taiwan and Macao, the well developed infrastructure versus other emerging markets, and the underdeveloped judicial system are all attractions China has for the foreign direct investment. Moreover, doing manufacturing in china not only makes the price competitiveness but also helps to reach the product to other Asian countries associated with China.

Table 1

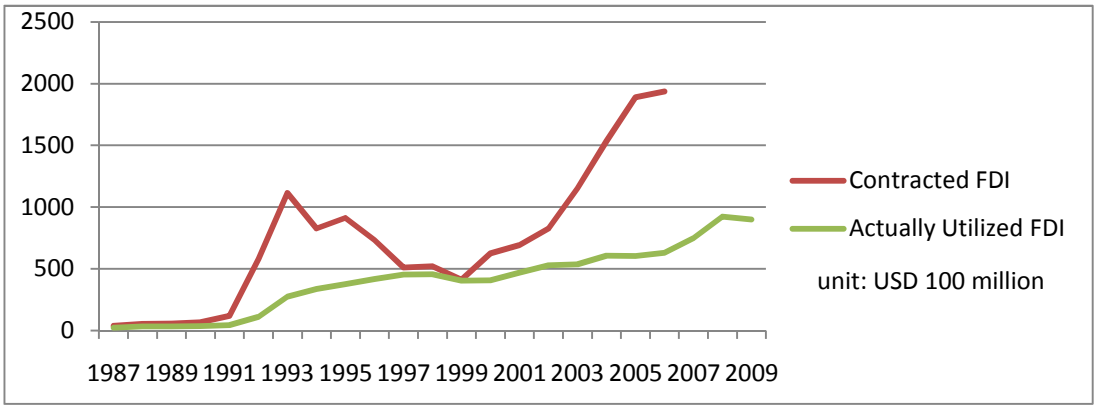
Contracted and Actually Utilized FDI from 1987 to 2009 Unit: US$100 Million

Year	Contracted FDI	Actually Utilized FDI	Year	Contracted FDI	Actually Utilized FDI
1987	37.09	23.14	1998	521.02	454.63
1988	52.97	31.94	1999	412.23	403.19

Table 1 Continue

Year	Contracted FDI	Actually Utilized FDI	Year	Contracted FDI	Actually Utilized FDI
1989	56	33.92	2000	623.8	407.15
1990	65.96	34.87	2001	691.95	468.8
1991	119.77	43.66	2002	827.68	527.43
1992	581.24	110.07	2003	1150.69	535.05
1993	1114.36	275.15	2004	1534.79	606.3
1994	826.8	337.67	2005	1890.65	603.25
1995	912.82	375.21	2006	1937.27	630.21
1996	732.76	417.26	2007	N/A	747.68
1997	510.03	452.57	2008	N/A	923.95
			2009	N/A	900.33

Source: China Statistic Year Book 1988-2010



Source: China Statistic Year Book 1988-2010

Figure 1 Contracted and Actually Utilized FDI from 1987 to 2009

Unit: US$100 million

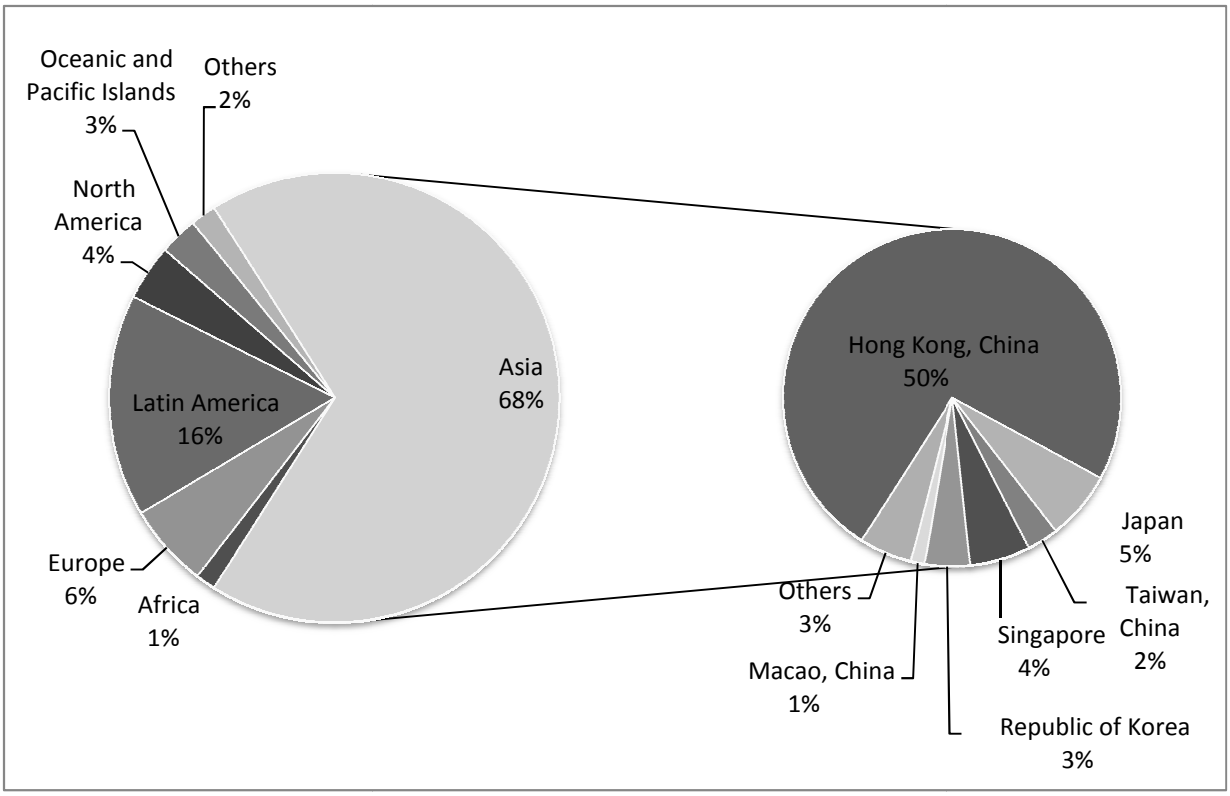
From the above figure we can see that foreign direct investment in China has exhibited an increasing trend since 1987, after China has opened up its first Special Economic Zones to foreign trade and investment. FDI inflows have since then increased tremendously, and the number of international investors was growing steadily. During the period of 1987 to 1991, FDI inflows remained relatively low due to the joint ventures with Chinese state-owned enterprises. Xiaoping Deng made his famous southern tour of China in the spring of 1992, encouraging personal entrepreneurship and wholly-owned subsidiaries of foreign companies, which fostered a new wave of foreign direct investment. The economic reforms began to generate steady growth in FDI. From the beginning of the reforms legalizing foreign investment, capital inflows expanded every year until 1997. The Asian financial crisis in 1997 has not affected China directly, but the deterioration of the economic situation in the South-East Asian countries has resulted in the decline of their investment capacity, thus slowed down the FDI inflows during the period of 1997 to 1999. With the recovery of the economic crisis, FDI increase steadily since 2000. Even though there was a slight dip in FDI in 2009 as a result of the global economy slowdown, 2010 has again seen investments increase in China, with Beijing's foreign direct investment estimated to reach around US$100 billion.

Before 1990, contracted FDI and actually utilized FDI remained at the same level. In the early 1990s, however, contracted FDI exceeded actually utilized FDI by a large margin. This gap narrowed in 1997 as the authorities became more realistic in registering inflows. However, it has widened again sharply after 1999, which shows

that there is still inefficiency in the usage of FDI.

2. Sources of FDI in China

Another remarkable characteristic of FDI inflows in China is the sources of FDI. Foreign direct investment in the real estate market has been dominated by Asian companies, often owned by Chinese overseas. These companies come from Hong Kong, Taiwan and South East Asia. Figure 2 presents the sources of FDI in China.



Source: China Statistic Year Book 1998-2010

Figure 2 FDI Actually Utilized by Countries or Regions

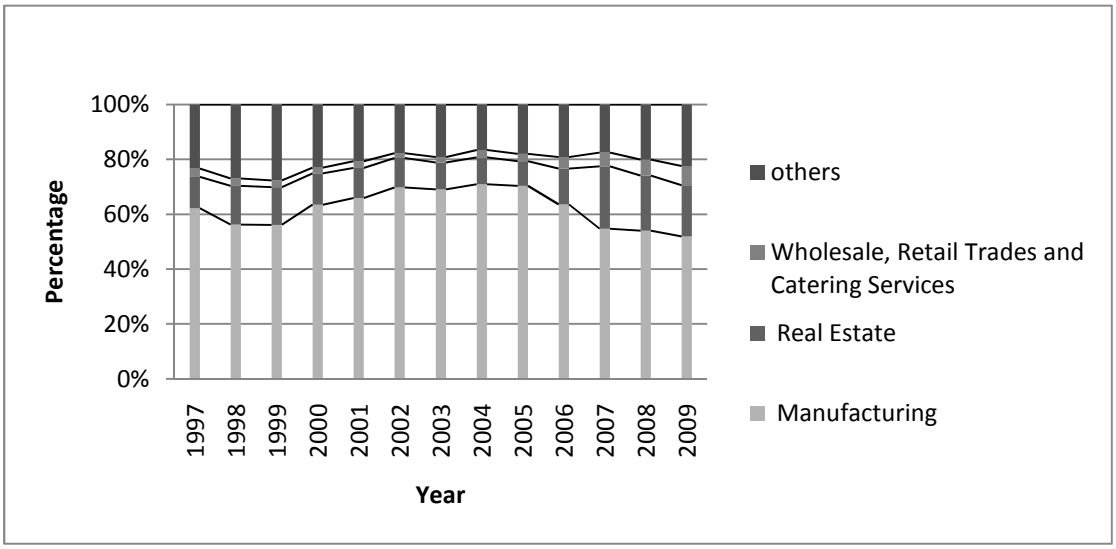
Unit: US$10,000

We can see from figure 2 that the source of actually utilized FDI in China is composed of investment from Asia, Latin America, Europe, North America, Africa,

Oceanic and pacific islands and other regions. Among all the countries and regions, 68% of FDI in China has originated from elsewhere in Asia. Hong Kong, now a self-governing "special autonomous region" of China itself, has been the largest source of record, which composes 50% of the total investment from Asia. The dominance of Hong Kong, however, is somewhat illusory in that much FDI nominally from Hong Kong in reality is from elsewhere. Some of what is listed as Hong Kong-source FDI in China is, in fact, investment by domestic Chinese that is "round-tripped" through Hong Kong. Other FDI in China listed as Hong Kong in origin is in reality from various western nations and Taiwan that is placed into China via Hong Kong intermediaries.

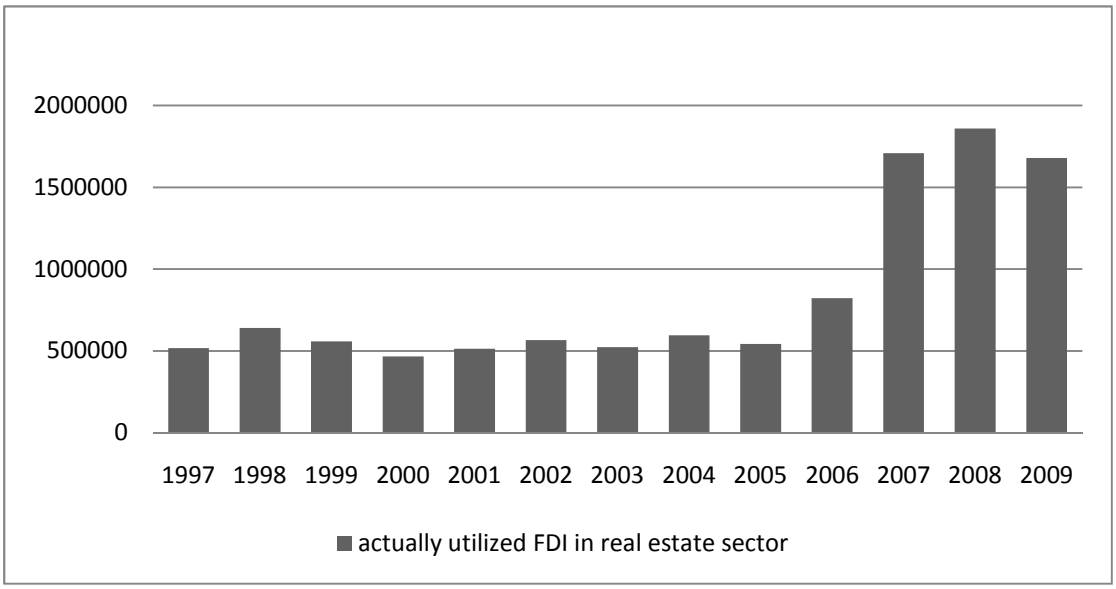
3. Sector distribution of FDI in China

As shown in figure 3, foreign direct investment in China is largely concentrated on the manufacturing industries, which accounts for more than 50% of the overall FDI inflows in China. Next follows real estate sector, which has experienced notably growth in the last few years, and accounts for more than 20% of the overall FDI inflows in China. The wholesale, retail trades and catering services takes a portion of averagely 6 percent, with 2009 hitting 6.92%.



Source: China Statistic Year Book 1998-2010

Figure 3 FDI by Sector from 1997-2009 Unit: US$100 million



Source: China Statistic Year Book 1998-2010

Figure 4 FDI in Real Estate Sector from 1997-2009

Unit: US$10,000

The rapid growing real estate sector in China has become a lucrative target for foreign investor as housing prices have continued to soar despite the government's

tightening measures. Foreign direct investment in China's real estate sector leveled around 5 billion between 1997 and 2005 and surged to 8 billion in 2006. From 2007 to 2009, FDI grew by more than 100% than 2006, which is much higher than the growth rate for total FDI inflows to China. According to the ministry of commerce, the first 11 months of 2010 has seen US$ 20.1 billion of foreign investment went into China's real estate sector. Meanwhile, total FDI in China grew by 17.73% during the same period, hitting US$ 91.7 billion. According to the National Bureau of Statistics of China, between January and November of 2010, foreign direct investment increased by 59.0% compared with last year's figure, surging to $ 9.92 billion among the fund sources of real estate developing companies. According to State Administration of Foreign Exchange estimates, FDI now accounts for 15% of China's real estate market. Investment in this industry has become an important channel through which so-called "hot money" flows into the country.

Even though some analysis maintains that the FDI surge in real estate should not be seen as a sign of "hot money" inflows since property developers in big cities are in need of more investment. There is a growing common concern of the real estate bubble resulted from the "hot money" inflows. The following table presents the Average Selling Price of Commercialized Buildings from 1987 to 2009.

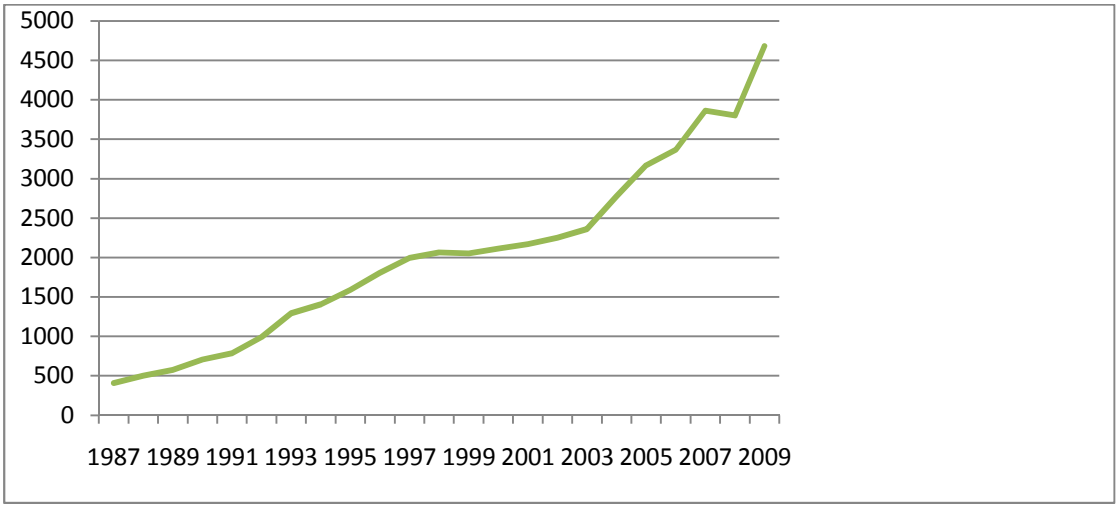
Table 2

Average Selling Price of Commercialized Buildings from 1987 to 2009

Unit: Yuan/Sq.m

Year	Average Selling Price of Commercialized Buildings	Year	Average Selling Price of Commercialized Buildings
1987	408.183	1998	2063
1988	502.9	1999	2053
1989	573.5	2000	2112
1990	702.85	2001	2170
1991	786.19	2002	2250
1992	994.66	2003	2359
1993	1291.46	2004	2778
1994	1408.64	2005	3168
1995	1590.86	2006	3367
1996	1806.4	2007	3864
1997	1997	2008	3800
		2009	4681

Source: China Statistic Year Book 1988-2010



Source: China Statistic Year Book 1988-2010

Figure 5 Average Selling Price of Commercialized Buildings by Use from 1987-2009

Unit: Yuan/Sq.m

The economic reform in 1978 was the starting point for major changes in the real estate market and the market is now becoming more and more accessible for private property developments. The average price per square meter is 408.183 Yuan in 1987 compared to 4681 Yuan per square meter in 2009. The average monthly income in China is only 2058.7 Yuan in 2009. This implies that the majority of the urban residents may be unable to afford an apartment. We can see from the figure that the average housing prices in 2009 rose up to 30 percent from 2007 levels, proving that the international financial crisis has done nothing to effect an adequate adjustment of the Chinese property market. Now that a new round of price increases has begun, China is feeling the negative effects of an apparent real estate bubble.

CHAPTER 4

Empirical study on the impact of FDI on the real estate sector in China

1. Methodology

Linear regression model and granger causality test are conducted to make an empirical assessment of the link between the utilized FDI and the average selling price of the commercialized buildings in China. Data for the utilized FDI and average selling price of the commercialized builds are taken from the China Statistic Year Book and are presented in Table 1 and Table 2. Time periods under examination are between 1987 and 2009.

2. Linear Regression Model

The linear regression model used is as follows: $Y=B_0+B_1X+$□

Where the independent variable X is the utilized FDI and the dependent variable Y is the average selling price of the commercialized buildings. Ordinary Least Squared (OLS) method is used to calculate the regression coefficients B_0 and B_1, The formulas are given as follows:

$$B_1 = \frac{\sum_{i=1}^{n}(xi-\bar{x})(yi-\bar{y})}{\sum_{i=1}^{n}(xi-\bar{x})^2}$$

$$B_0=\bar{y} - B_1\bar{x}$$

The result of the estimation equation is:

LOGPRICE = 4.359513+ 0.550550*LOGFDI.

The P values for the t statistics are 0 which implies that both B_0 and B_1 are statistically

significant. The R-squared value is 0.929718 which imply that nearly 93% of the variation in the log form of average selling price of the commercialized buildings can be explained by the log form of the utilized FDI.

3. Unit root test

The strong association between FDI and real estate price indicated in the linear regression model does not necessarily mean causality from the former to the latter. In order to examine the impact of the utilized FDI on the average selling price of the commercialized buildings in China, granger causality test is applied. Before conducting granger causality test, we need to make sure that the time series of the variables are stationary. Figure 6 presents the graph for the LOGFDI

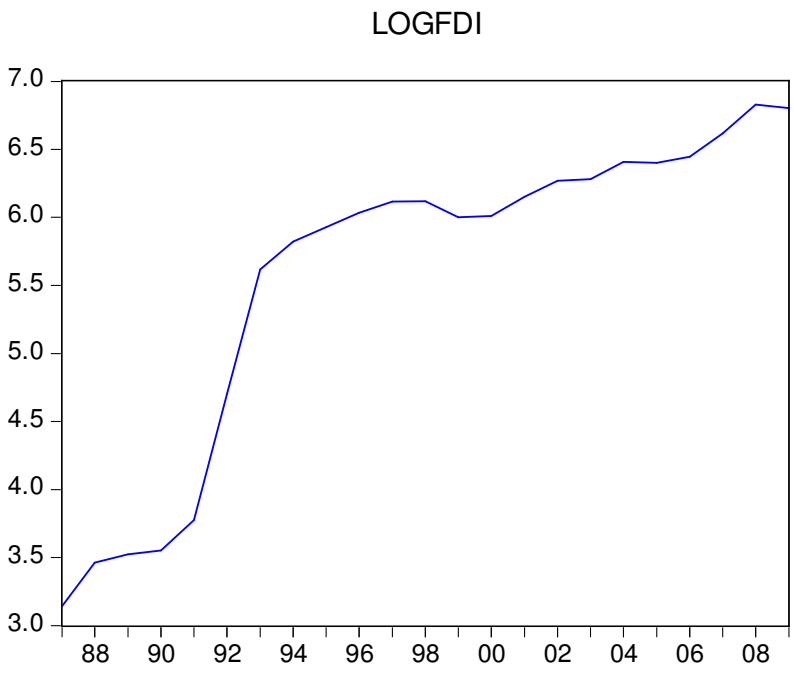


Figure 6 LOGFDI

From the plot of the LOGFDI we can identify that the time series has a trend. There is a sharp increase in the LOGFDI between the periods of 1991 to1993, which coincides with the fact that during these periods, several southern coastal cities in China are fostering personal entrepreneurship and wholly-owned subsidiaries of foreign companies to attract FDI inflows. Figure 7 presents the graph of the first difference of LOGFDI towards its mean.

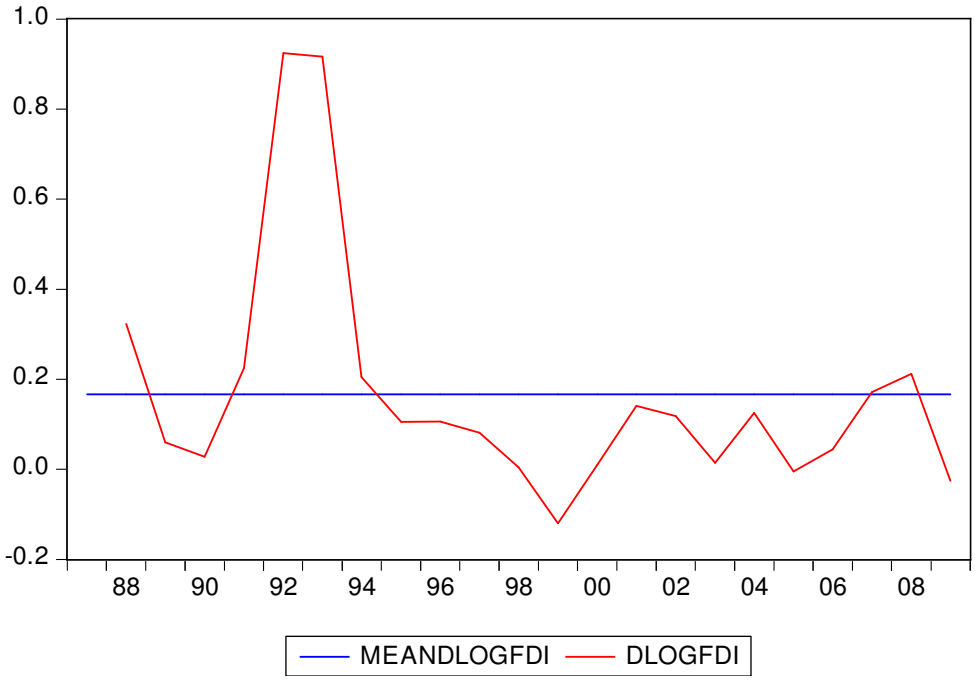


Figure 7 DLOGFDI

To make the time series stationary I plot the first difference of the LOGFDI which is the growth rate of FDI. The graph shows that the growth rate of FDI inflows experienced a dramatic increase during the period of 1991-1993 which makes the first difference of LOGFDI a non-stationary time series.

To test the unit root of the time series, we use the Augmented Dickey-Fuller (ADF) test. As a rule of thumb, if the DW is less than 2, there is evidence of positive serial correlation. The DW statistic in our output presented in the Appendix is 0.4164, indicating the presence of serial correlation in the residuals. The Augmented Dickey-Fuller (ADF) Test constructs a parametric correction for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the test regression:

$$\Delta y_{t=}\beta_1 + \beta_2 t + \delta y_{t-1} + \sum_{i=1}^{m} \alpha_1 \Delta y_{t-1} + \epsilon_t$$

where ϵ_t is a pure white noise error term.

The optimum lag lengths in the test are selected using the Schwarz information criterion with the maximum number of lags set at 4 for both ADF test and Granger Causality Test. As has often been done in the literature, a constant is included but no time trend in the unit root test. The results of the ADF unit root tests are summarized in the Appendix.

The absolute value of the t-Statistic obtained from the test for unit root in Level form is greater than the absolute value of the test critical values at the 5% significance level. So we can reject the null hypothesis that LOGFDI has a unit root with 95 percent confidence. However, from the graph we plotted for LOGFDI, we can clearly observe an upward trend in the time series.

In order to make the time series stationary, we take the first difference of the LOGFDI and test the unit root for the first difference. The absolute value of the t-Statistic obtained from the test for unit root in the first difference term is smaller

than the absolute value of the test critical values at the 10% significance level. So we cannot reject the null hypothesis that D(LOGFDI) has a unit root.

We take the second difference of the LOGFDI and find the absolute value of the t-Statistic obtained from the test for unit root in second difference is greater than the absolute value of the test critical values at the 5% significance level. So we can reject the null hypothesis that D(LOGFDI,2) has a unit root. Therefore we can conclude that the time series for LOGFDI is integrated of order 2.

The graph for LOGREP which is the log form of the average selling price of the commercialized buildings, the first difference of LOGREP and the second difference of LOGREP are presented below.

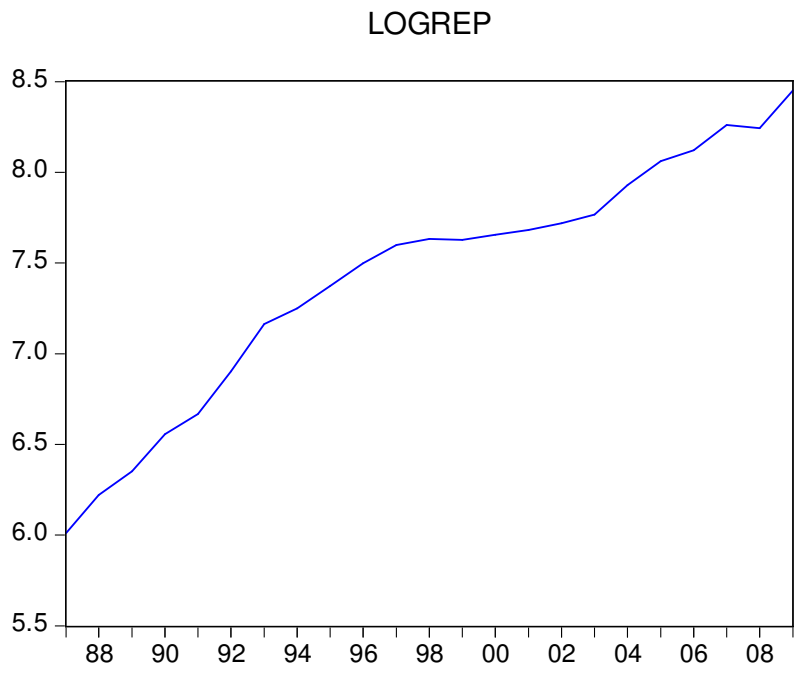


Figure 8 LOGREP

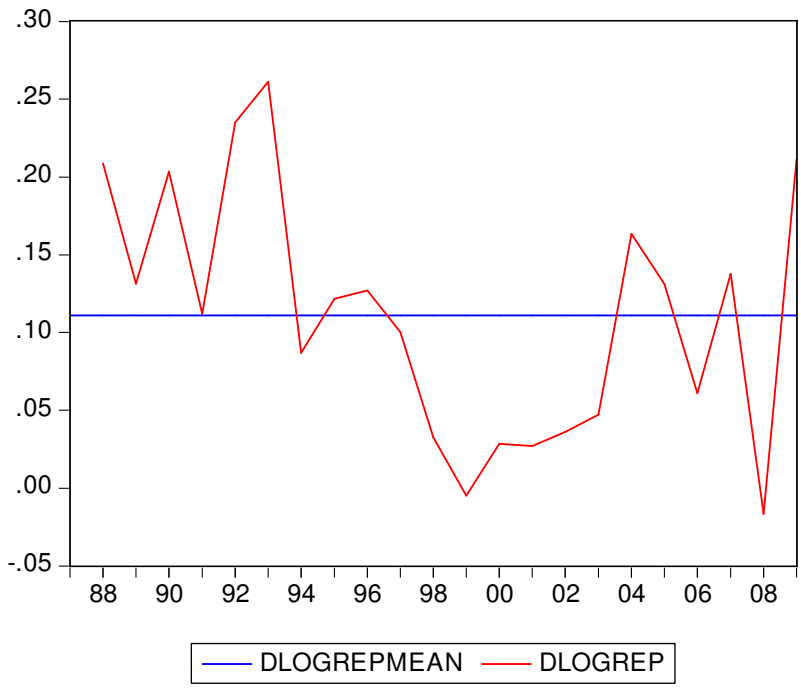


Figure 9 DLOGREP

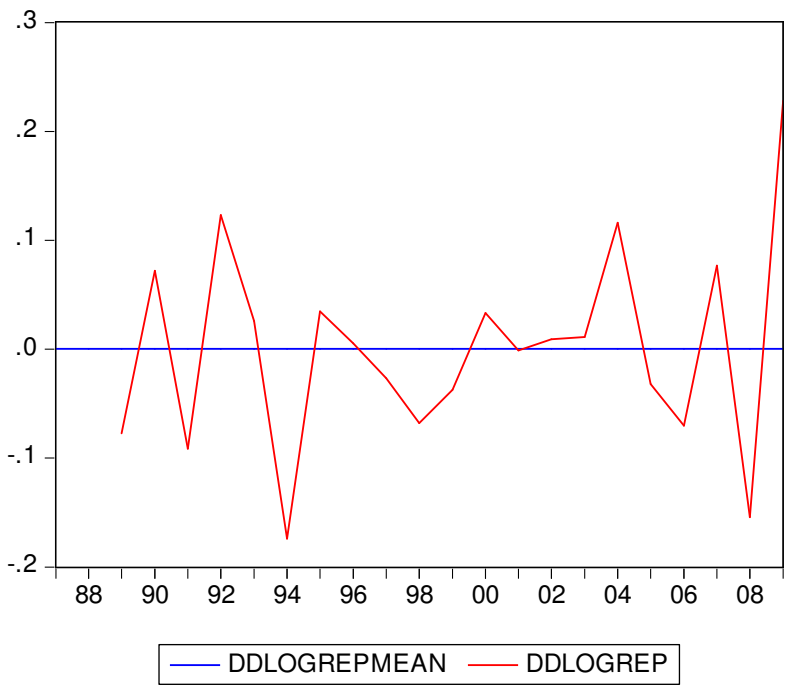


Figure 10 DDLOGREP

From the three graphs presented above, we can see that the level form of LOGREP has a upward trend and the time series is much stationary after the second difference. The results of the ADF unit root tests are summarized in the Appendix.

The absolute value of the t-Statistic obtained from the test for unit root in Level form is less than the absolute value of the test critical values at the 5% significance level. So we can not reject the null hypothesis that LOGREP has a unit root.

The absolute value of the t-Statistic obtained from the test for unit root in the first difference term is greater than the absolute value of the test critical values at the 5% significance level. So we can reject the null hypothesis that D(LOGREP) has a unit root with 95% confidence.

4. Granger causality test

In doing analysis of how the inflows of FDI would affect the real estate prices, we would like to know whether changes in FDI variable will have an impact on changes on the real estate price variable. The granger causality test assumes that the information relevant to the prediction of the respective variables is contained in the time series data on these variables.

To test for Granger causality, we first regress ΔY on its lagged values. The regressions are performed in terms of ΔY rather than Y since the independent variable in our case is not stationary. Once the set of significant lagged values for ΔY is found, the regression is augmented with lagged levels of ΔX. Any particular lagged value of ΔX is retained in the regression if it is significant according to t-test, and it and the other lagged values of ΔX jointly add explanatory power to the model according to an

F-test. Then the null hypothesis of no Granger causality is rejected if there are lagged values of ΔX retained in the regression.

Table 3

Results from Granger Causality Test

Direction of causality	F value	Decision
Utilized FDI→Average selling price of commercialized buildings	5.43127	Reject
Average selling price of commercialized buildings→ Utilized FDI	0.49244	Do not reject

These results suggest that the direction of causality is from Utilized FDI to average selling price of the commercialized buildings. Based on the Probability values reported in the table, the hypothesis that DLOGPRICE does not Granger Cause DLOGFDI cannot be rejected, but the hypothesis that LOGFDI does not Granger Cause LOGPRICE can be rejected. Therefore, it appears that Granger causality runs one way, from LOGFDI to LOGPRICE.

CHAPTER 5

Conclusion

The linear regression analysis and granger causality test verify our expectation that the increase in the inflows of FDI contribute significantly to the increase in the real estate prices. The main implication from our analysis is that various restrictions need to be implemented to cool down the real estate industry due to overwhelming amount of foreign direct investment. We should note that a series of regulations have already been issued to encourage foreign direct investment to the manufacturing industry, high-tech industries, modern service industry, new energy and energy-saving environmental protection industry. During December 2007 the central government has amended the foreign investment catalogue which divides the foreign investment market to encouraged, restricted and prohibited industries. Prior to the recent amendment, development of residential housing was an encouraged industry and received governmental incentives. However, the new catalogue of 2007 removed the development of residential housing from the encouraged industries and thus complicated the approval process. Due to the guidance of the policy, FDI in real estate sector remains at a steady level and the portion of the foreign direct investment in the sources of funds of enterprises for real estate development has been below 5% in the past 10 years and there is a decreasing trend of the percentage year by year.

Awareness of real estate market risks should be found at all levels of China's central and local governments. Several control measures need to be introduced in areas such as taxes, credit, land supply and housing construction.

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APPENDICES

APPENDICES

1. Linear regression model output

Dependent Variable: LOGPRICE

Method: Least Squares

Date: 04/11/11 Time: 23:17

Sample: 1987 2009

Included observations: 23

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.360012	0.187618	23.23876	0.0000
LOGFDI	0.550438	0.032986	16.68691	0.0000

R-squared	0.929872	Mean dependent var	7.423485
Adjusted R-squared	0.926533	S.D. dependent var	0.684569
S.E. of regression	0.185552	Akaike info criterion	-0.448026
Sum squared resid	0.723017	Schwarz criterion	-0.349288
Log likelihood	7.152304	Hannan-Quinn criter.	-0.423194
F-statistic	278.4529	Durbin-Watson stat	0.415593
Prob(F-statistic)	0.000000		

2. ADF unit root test for the level, first difference and second difference of LOGFDI

Null Hypothesis: LOGFDI has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.072690	0.0452
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LOGFDI) has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.668460	0.4303
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Null Hypothesis: D(LOGFDI,2) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.852874	0.0012
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

3. ADF unit root test for the level, first difference and second difference of LOGREP

Null Hypothesis: LOGPRICE has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.578034	0.1123
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

Null Hypothesis: D(LOGPRICE) has a unit root

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.242962	0.0315
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

Null Hypothesis: D(LOGREP,2) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.119286	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

4. Table output for the granger causality test

Pairwise Granger Causality Tests

Sample 1987 2009

Lags: 4

Null Hypothesis:	Obs	F-Statistic	Prob.
DLOGREP does not Granger Cause DLOGFDI	18	1.04296	0.4370
DLOGFDI does not Granger Cause DLOGREP		5.46623	0.0163

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