

# EXPLORING THE INCREASING ROLE OF THE REAL ESTATE SECTOR IN THE CHINESE ECONOMY: 1997-2002

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## ABSTRACT

*The Chinese government launched a series of real estate reform policies in 1998, which further changed the real estate sector from socialist plan-oriented to modern market-oriented. This paper compares the role of the real estate sector in the Chinese economy in years 1997 and 2002 by using the recently published input-output OECD database. Results verify that the Chinese real estate sector played an increasing role in the Chinese economy with higher contributions and stronger push and pull power in 2002 than those in 1997. However, compared with other countries, especially for some OECD countries, the Chinese real estate sector has a relative lower contribution.*

**Keywords:** Real estate, input-output analysis, linkage, China

## INTRODUCTION

In 1998, the Chinese government launched a series of real estate reform policies, which further changed the real estate sector from a socialist plan-oriented to modern market-oriented one (Zhao and Bourassa, 2003). Before 1987, there was no real estate market in China (Han, 1998, Fung et al., 2006). Land was not considered as a commodity and had no value (Ding, 2003). The housing units were produced, owned and allocated by the state or state agent. As a result, maintenance and construction costs brought the government a heavy financial burden (Lee, 2000). The Chinese government had to introduce reform to gradually promote the real estate products privatization. The reform was accelerated in 1998. Supported by some housing, financial, land and property management policies, the

real estate investment growth rate began to pick up. From 1998 to 2002, the average growth rate of investment in China's real estate sector was around 20 percent (Fung et al., 2006; Zhao et al., 2006). On the other hand, the real estate lease and property management activities were activated (Zhao and Bourassa, 2003). It has to be noted that the introducing of market mechanisms led to an unprecedented restructuring of the Chinese real estate system (Tang et al., 2006). Considering it directly and indirectly fueled in the country's annual GDP and its significant role in improving people's living conditions and generating jobs, the real estate sector was treated as a key industry in China (Guo, 2005).

The reform of the Chinese real estate sector has attracted lots of research interest (Han, 1998; Lee, 2000; Ding, 2003; Zhao and Bourassa, 2003; Guo, 2005; Fung et al., 2006; Tang et al., 2006; Zhao et al., 2006). These studies are mainly focused on the change of real estate policies. Several papers reflect the change of sectoral structure which is very important for policy authority and investors to understand to develop the right strategy (Wang and Liu, 2004; Liu et al., 2005). Input-output analysis is regarded as an efficient tool to measure the role of a sector and to study those structural changes in an economy (Guo and Planting, 2000; Su et al., 2003). This paper aims to explore the increasing role of the real estate sector in China by using the input-output (IO) method and recently published input-output database of Organization for Economic Co-operation and Development (OECD). Through comparisons of the sector's contributions to the Chinese economy, as well as its dependency relationships with other sectors before and after the reform in 1998, a new insight of the sector's impact on the national economy can be found.

The remainder of this paper is composed as follows. After a literature review of the IO analysis on the real estate sector, the third section provides a briefly explanation of the methodology and data. The fourth section focuses on the change of the real estate sector's share in the Chinese national economy before and after 1998. Then, in the next two sections, its dependency relationships with other sectors, in other words, its push and pull effects to the whole economy are analyzed to identify the sector's impact on the national economy.

## **LITERATURE REVIEW**

Input-output analysis focuses on the industrial structure of an economy. By analyzing all input and output flows of goods and services within an economy, the input-output technology may describe the quantitative dependent relationship between the real estate sector and others, which reflects the importance of the real estate sector in the national economy (Liu et al., 2005). Pioneered by Leontief, this practical tool of analysing the economy as a whole is widely applied in different countries and sectors (Raa, 2006). However, there were few IO researches focusing on the real estate sector (Liu et al., 2005). Li (2003) presented a basic IO analysis of real estate and the national economy in China Mainland. Based on the 1997 Chinese national IO table, Wang and Liu (2004)

adopted input-output coefficients to analyze the forward and backward quantity correlation between the real estate sector and other industries for China, and compared with four member countries of the OECD, aimed at finding the inner structure and mutual affections between the real estate sector and other industries. Klein (2003) studied the potential linkage of IO analysis with flow-of-funds in the real estate market. Liu and Song (2005), explored the quantitative interdependence amongst the real estate sector and other industries in seven developed economies. They proposed a linkage measure framework to explore the effect of real estate to other sectors (Song et al., 2005, Song et al., 2006, Song and Liu, 2007). Although previous papers offered some useful approaches to measure the role of the real estate sector, there are still many shortfalls. On one hand is the imprecision of data and methodology. It must be noted that the classification of industries is not identical in different countries. In addition, international comparisons were only concerned with some OECD countries.

## **METHODOLOGY AND DATA**

The analysis is built upon a series of indicators derived from the input-output table. Shares of real estate in Gross National Product (GNP), Gross National Income (GNI), Gross Household Demand (HHFC), Gross Fixed Capital Formation (GFCF), as well as Gross Compensation of Employees (CE), are used to estimate its contribution to economic development. Direct forward linkage, which shows the intermediate demand to total output ratio of the real estate sector, is applied to measure the strength of the sector's push on the national economy. Analogously, direct backward linkage, the intermediate to total input ratio, is applied to evaluate the strength of the sector's pull on the national economy. There is also a discussion about the inter-industry linkage through direct output and input indicators. The calculation method of involved basic indicators is not included in this paper; refer to Song (2005) for the introduction of economic indicators in the real estate IO analysis.

There were several shortcomings in former researches as described above. First, the applied OECD database employs a common sector classification following the International Standard Industrial Classification (ISIC) version two and divided into 36 sectors. The real estate activities belong to the real estate & business service sector (Liu et al., 2005). Errors may be inevitable since some of the real estate sector's statistical data is inaccurate. In addition, international comparisons only covered those OECD countries. An insight of the real estate sector's role in non-OECD is needed. The publishing of the newest OECD domestic industry-by-industry symmetric IO tables in 2006 offers an opportunity to remedy these defects. Different with the former database, new tables classify the economy into 48 sectors, based on ISIC version three (Yamano and Ahmad, 2006). Real estate activity is listed individually. This modification implies that more accurate results can be available.

The analysis is based on the 1997, 2000 and 2002 Chinese input-output tables and another

ten countries' data during 1994 and 2000 from the OECD database. Aimed to analyze the changes of the real estate sector's impact on the national economy in China due to the reform policy in 1998, the examined period is divided into two stages: before and after 1998. It is hard to find data of other countries that exactly covers both of the two stages. The selected countries and their IO tables are reported in Table 1. These countries can be divided into two groups. Group one involves five non-OECD countries (Argentina, Brazil, China, Indonesia, and India) which fall behind in economic development level and industrialization. Group two includes six OECD countries (Canada, Denmark, Japan, Sweden, UK and USA).

The 2006 edition OECD input-output database includes the latest tables which are based around the year 2000 for most countries, though for some, more recent years are provided; for instance, 2002 for China. Theoretically, it is assumed that the technological and allocation relationships, which mean the industrial structure of an economy, are relatively stable for a period of time (Bon, 2000). Thus, applying the latest tables, the input-output analysis can give a new insight of the past as well as the current situation of the real estate sector. In addition, comparing with some mature economies, such as those selected OECD countries, it makes possible a prediction of the development trend of the Chinese real estate sector in the future.

**Table 1: OECD input-output table coverage**

Countries	Argentina	Brazil	China	India	Indonesia	
Before 1998	1997	1995	1997	1994	1995	
After 1998	N/A	2000	2000 2002	1999	2000	
Countries	Canada	Denmark	Japan	Sweden	UK	USA
Before 1998	1997	1997	1995	1995	1995	1997
After 1998	2000	2000	2000	2000	2000	2000

## THE INCREASING SHARE OF THE REAL ESTATE SECTOR IN THE CHINESE ECONOMY

The contribution in GNP and GNI can give a clear depiction of the role of the real estate sector in the economy. The bigger these share values are, the more important the real estate sector is. In addition, analyzing the share of real estate in gross household demand (HHFC), Gross Fixed Capital Formation (GFCF), as well as Gross Compensation of Employees (CE) will help to understand the effect of the real estate sector in domestic consumption, production and employment.

Table 2 shows the five indicators of the Chinese real estate mentioned above, and their rank compared with other sectors from 1997 to 2002. There is a noticeable difference over

this period. During the first stage, before 1998, the share of the real estate sector in GNP and GNI were less than 0.02, smaller than many other sectors. Other indicators and their ranks were all at a relative lower level too. This implies that the real estate sector didn't play a significant role in China during this period. However, in the second stage, between 2000 and 2002, the development level of the Chinese real estate sector rose sharply. The sector contributed 0.036 in GNP, which grew 252% compared with that in 1997. And the share in GNI has an increase of 237% from 1997 to 2002. With an exception of the share in GFCF, each value grew to more or less double in the second stage. At the same time, except the share in CE, every rank climbed to the top 10 in the economy, which is the evidence of the more vital role of the real estate sector in China. The sector has, at this time, a much greater influence on China's production, consumption, and employment than ever before. Furthermore, it suggests that the real estate sector is more efficient in generating jobs than in creating household consumption and fixed capital formation. This is mainly because real estate has a major role in creating and meeting social demand (Roulac, 1999). The performance of the real estate sector in these two stages shows that the real estate sector's role has increased in the discussed period in China.

**Table 2: Shares of the Chinese real estate sector in national economy: 1997-2002**

Year	Share in GNP	Rank	Share in GNI	Rank	Share in HHFC	Rank	Share in GFCF	Rank	Share in CE	Rank
1997	0.014	17	0.019	17	0.030	6	0.007	11	0.005	28
2000	0.018	16	0.020	21	0.035	6	0.016	8	0.006	30
2002	0.036	9	0.044	6	0.083	3	0.020	6	0.019	18
Increasing rate	252%		237%		276%		274%		343%	

The increasing role of Chinese real estate is a result of the housing reform processes. From 1997 to 2000, there were several important new policies adopted by the Chinese government, and resulted in a boom of the real estate sector in the following period (Fung et al., 2006). Before 1987, there was no real estate market in China. The housing units were produced, owned and allocated by the state or state agent. In July 1998, the government announced a series of policies to accelerate real estate reform. Urban residential housing units stopped to be allocated. And non-state-owned real estate developers were encouraged to offer more houses and services. All of these factors caused a huge increase in real estate investment. The Chinese government simultaneously adopted some financial policies to promote the consumption of real estate product. For instance, the decreasing interest rates and increasing mortgage loans efficiently increased the demand of real estate (Zhang and Sun, 2006). According to the data of National Bureau of Statistics of China (NBSC, 2003), there were 268 million sq m. of commercial houses sold in 2002, nearly 3 times as much as that in 1997. As can be seen in Table 2, the share of real estate in gross household consumption (HHFC) jumped from about 0.03

before 2000 to more than 0.08 in 2002. At that time, the real estate market rent increased, the real estate lease and property management activities were activated (Zhao and Bourassa, 2003). The series of Chinese reform policies in 1998 deeply affected the input and output systems of the real estate sector. As a result, the sector has changed from a relatively unimportant sector to be one of the most contributing sectors in the Chinese economy.

The development of the real estate sector in China can also be observed when making a comparison at an international level. A description of the ranks of eleven countries' real estate shares in national economies is listed in Table 3.

**Table 3: The share of real estate in national economy in 11 countries before and after 1998**

Countries	Share in GNP		Share in GNI		Share in HHFC		Share in GFCF		Share in CE	
	Before 1998	After 1998	Before 1998	After 1998	Before 1998	After 1998	Before 1998	After 1998	Before 1998	After 1998
<b>Argentina</b>	1	N/A	1	N/A	1	N/A	1	N/A	N/A	N/A
<b>Brazil</b>	2	1	2	1	N/A	1	N/A	N/A	3	2
<b>India</b>	3	3	3	3	4	3	3	2	N/A	N/A
<b>Indonesia</b>	4	4	4	4	2	4	N/A	N/A	2	3
<b>China</b>	<b>5</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Sweden</b>	1	4	1	4	1	1	3	6	1	4
<b>UK</b>	2	6	5	6	3	6	2	5	2	3
<b>Denmark</b>	3	5	4	5	2	2	1	4	N/A	6
<b>Japan</b>	4	1	3	1	6	3	N/A	7	3	5
<b>USA</b>	5	2	2	3	5	5	5	1	N/A	7
<b>Canada</b>	6	3	6	2	N/A	4	N/A	2	N/A	1
<b>China</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>4</b>	<b>7</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>2</b>

These ranks are compared, respectively, before 1998 versus after 1998. At the first stage, China's shares in GNP and GNI are the lowest either in non-OECD countries or in OECD countries. But after 1998, the two indicators' value for China exceeded India and Indonesia, ranking No.2 in the four non-OECD countries. During this period, these ranks of share in HHFC, GFCF and CE among non-OECD countries increased slightly. This reflects the increasing rate of the real estate sector in China is higher than other selected non-OECD countries. However, the real estate sector's development level in China is still lower than those in OECD countries. In every OECD country, the real estate sector contributes a larger proportion in GNP and GNI than in China. The results also show that the share of the real estate sector in GFCF and CE in China rose faster in this period. It

can also prove that the real estate sector performed an increasing role in the Chinese economy in this period.

## **THE CHANGING PUSH AND PULL EFFECTS OF THE CHINESE REAL ESTATE SECTOR**

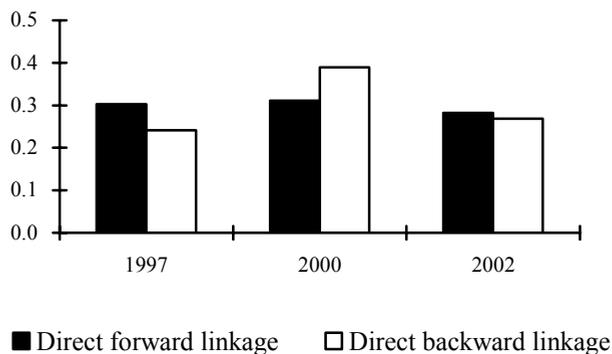
Previous studies on the role of the real estate sector in China have a limitation in comprehensively reflecting the change of the economic structure; for instance, changes of the linkage of a sector. In order to identify the push and pull effects of a sector, direct forward and backward linkages indicators are widely applied. Direct forward linkage reflects the share of intermediate demand for a sector in its total output. It offers impetus to the economy through a supply side and shows the sector's consumption structure indirectly (Polenske and Sivitanides, 1990). Direct backward linkage pulls economic growth through the process of creating demand, as it is the proportion of industrial intermediate input in total input to one sector. Moreover, it can reflect the rough industrialization level of a sector (Pietroforte and Gregori, 2003).

### **Push and pull effects of the Chinese real estate sector**

The direct forward and backward linkages of the Chinese real estate sector are depicted in Figure 1. Its direct forward linkage which was 0.3025 in 1997 decreased to 0.2823 in 2002. In other words, the push effect of the real estate sector is slowly sliding down. This trend is because of the stimulation of the housing and financial policies mentioned above. When the real estate market was forming gradually, the expanding rate of final demand, especially household consumption, was much higher than that of intermediate demand of other sectors. During 1997 and 2002, the final demand of real estate increased 308%, while its intermediate demand just rose 270% in China (Chinese IO tables 1997, 2000, 2002).

**Figure 1: Direct forward and backward linkages of Chinese real estate sector**

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The changing of the direct backward linkage value seems more dramatic. It reflects a larger modification in input systems than in output. At the beginning stage after the real estate reform policies, the indicator was at a low level of 0.2409 in 1997. The government tried hard to promote investment. As a result, a growing number of investors flooded into the real estate sector. The intermediate input in 2000 was more than 1.5 times than that in 1997, while the proportion of value added in total input, including operating surplus, taxes on production and compensation of employees, only rose 28%. These imbalances made backward linkage experience a sudden growth to 0.3892 in 2000. To achieve equilibrium, in 2002 the primary input nearly doubled, much larger than 70% of increasing in intermediate input. It led to the backward linkage fall to 0.2687 in 2002; however, this was still higher than in 1997.

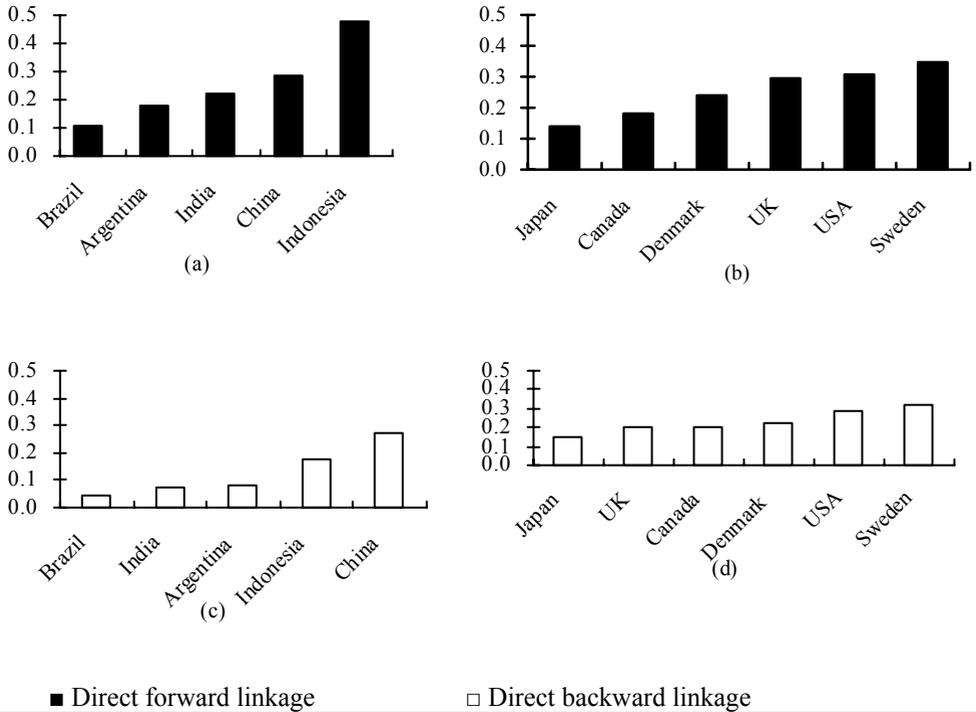
The fluctuation of the real estate sector's direct backward linkage is a reflection of the rational adjusting of the input structure. Theoretically, a larger value of backward linkage implies a stronger pull effect to the economy, as well as a higher level of technology. The pull effect of the real estate sector still has a slightly upward trend (Liu et al., 2005). It can also be found in China, which means the technology level of the real estate sector will become higher. However, because there was not enough data of China's real estate sector, this paper cannot verify the sector's impact on the Chinese economy in a longer period.

Figure 2 reflects the push and the pull effects of the real estate sector of selected countries in 2000, with a special case of China in 2002. Figures 2(a) and 2(b) show the direct forward linkage. Figure 2(a) includes five countries not in the OECD, while 2(b) contains ten OECD countries. The direct forward linkage value of China is larger than that of Brazil, India and Argentina among the non-OECD countries, and is similar to the UK. It

shows that the push effect of the real estate sector in non-OECD countries is a little weaker than those in OECD countries, except for Indonesia, which has the highest value (0.4760), than all selected countries. However, it is still hard to say whether the direct forward linkage of the real estate sector has a connection with the development level of an economy or not. This is due to the variations in the real estate sector's demand structure in different economies.

Figures 2(c) and 2(d) list the direct backward linkages of selected countries after 1998. Comparing the direct backward linkage, namely technical indicators, China ranked first out of five non-OECD countries. It demonstrates that the industrialization level of Chinese real estate is larger than that of these other countries. And the pull effect is stronger in China than that in other countries. When considering all of the selected countries, it is obvious that there is a correlation between stages of economic growth with the industry's direct backward linkage value. Most selected non-OECD countries, with an exception of China, have a smaller direct backward linkage value, which is less than 0.2. Direct backward linkage value is more than 0.2 in almost all of the OECD countries. However, Japan may be an exception in developed countries, whose linkage value is 0.1469, lower than China and Indonesia. This may be a result of the Japanese real estate bubble burst in 1990s, which lead to a dramatic decay in real estate investment in Japan. The differences between the two groups demonstrate that the technical level of the real estate sector is higher in a mature economy than that in those developing countries.

**Figure 2: Direct forward and backward linkages of selected countries**



Generally, the forward and backward linkage is a means of identifying key sectors for industry investment strategies, and determining which sector or sectors of the economy should be expanded or contracted (Polenske and Sivitanides, 1990). However, differential measure methods provide different results (Cardenete and Sancho, 2006). Although the government of China confirmed the real estate sector as one of its key sectors in 2003, there is still controversy about the sector's impact to the national economy. The direct forward and backward linkage value can reflect the sector's direct push and pull effect on the economy. It should be noted that the push and pull effects of real estate are lower than most other sectors of the economy in selected countries.

Table 4 displays the ranks of the real estate sector's direct forward (FL) and direct backward (BL) linkages among the economy in eleven countries. Each considered country's real estate sector ranked lower than 20 when compared to their direct forward linkage after 1998. Similarly, the direct backward linkage of the real estate sector was tiny, ranking between 39 and 48 in all the 48 sectors. Things were the same in China. Its rank of FL was at 33, while BL was at 39. These results reflect that the real estate sector is inefficient in terms of the direct push or pull of economic development. In order to make a

more accurate measurement of its effect on other sectors, other factors, for instance capital, labor and consumption, should also be discussed.

**Table 4: Rank of real estate sector's direct forward and backward linkages after 1998**

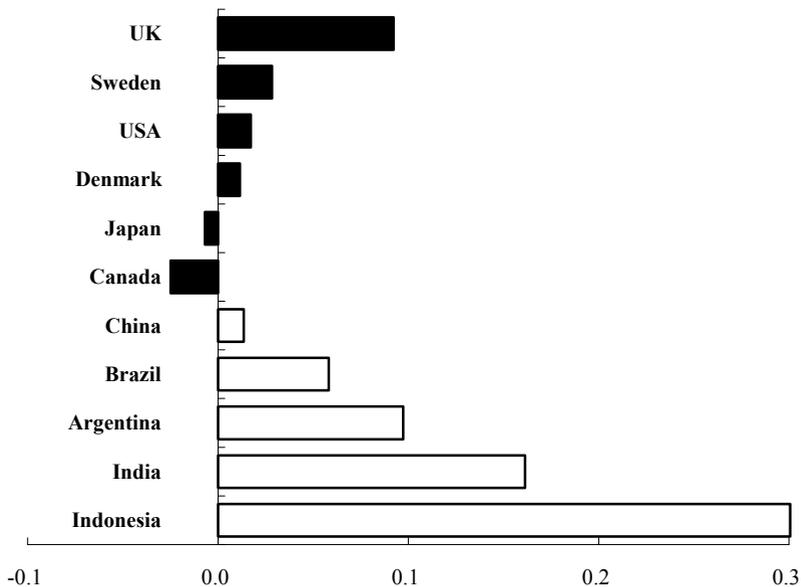
Countries	Argentina	Indonesia	India	Brazil	China	
FL	36	20	34	41	33	
BL	42	48	41	45	39	
Countries	Canada	Denmark	Japan	Sweden	USA	UK
FL	37	33	44	23	33	27
BL	42	44	47	39	44	39

### Differences between push and pull effects

Comparing the push effect as well as the pull effect together of a sector in a certain country helps to identify which kind of impression is more significant in promoting economic development. If one sector's direct forward linkage is larger than its direct backward linkage, it means the push effect of this sector is stronger than its pull effect. Figure 3 displays the differences between the direct forward and backward linkages of the real estate sector in eleven countries. Obviously, only Canada and Japan have a negative value. In these countries, prompting the real estate sector will have a larger impact on pulling other sectors, while its push effect will be relatively weak. Interestingly, the sector's push effect in every non-OECD country, including China, is stronger than its pull effect. Moreover, as shown in Figure 3, the gap between push and pull effects in a developing economy is more notable than in OECD countries. This is because the non-OECD countries predominantly lag behind the OECD countries in terms of industrialization of the real estate sector. In this regard, promoting the real estate sector to pull economic development is not as wise as boosting the entire national economy, and to reinforce the consumption ability to promote the real estate sector (Li, 2003).

**Figure 3: Differences of direct forward and backward linkages after 1998**

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## **THE ALTERNATIVE DIRECT EFFECT OF REAL ESTATE TO OTHER SECTORS IN CHINA**

The direct output indicator is employed to measure the push effect of the real estate sector to other sectors. The indicator means the share of one sector's purchase to the real estate sector's total output. Table 5 lists the top five sectors which demand the real estate sector's output from 1997 to 2002. Due to the reform policies in 1998, the private property management and broker activities were promoted in China. The role as a service sector of the real estate sector is strengthened. It shows that the wholesale & retail trade sector and finance sector have the strongest direct linkage with the real estate sector in China.

**Table 5: Ranked sectors of the push effects of the real estate sector in China: 1997-2002**

Rank	1997		2000		2002	
	Sector	Value	Sector	Value	Sector	Value
1	Wholesale & retail trade; repairs	0.0780	Wholesale & retail trade; repairs	0.1022	Public admin. & defence; compulsory social security	0.1002
2	Finance & insurance	0.0732	Finance & insurance	0.0511	Wholesale & retail trade	0.0450
3	Public admin. & defence; compulsory social security	0.0290	Other Business Activities	0.0418	Finance & insurance	0.0418
4	Social & personal services	0.0220	Public admin. & defence; compulsory social security	0.0262	Social & personal services	0.0194
5	Other Business Activities	0.0106	Electrical machinery & apparatus	0.0125	Real estate	0.0096

With an expectation of 2002, these two sectors consume more output from real estate than almost all other sectors. Their direct output indicator was always more than 0.4. Except for 2000, the top 5 sectors pushed by real estate are all service sectors, such as social security, other business services and the real estate sector itself. The attraction of service to the real estate sector is larger than other manufacturing and construction sectors. This is due to the fact that the major source behind the service output growth is the demand growth within services for the service sector (Hu and McAleer, 2004).

The pull effect of a sector is determined by input flows. The proportion of direct input of a sector to real estate's total input (direct input indicator) can reflect the pull effect of the real estate sector to this sector. Table 6 displays the top 5 sectors inputting to the real estate sector and their direct input indicator in China over the same period.

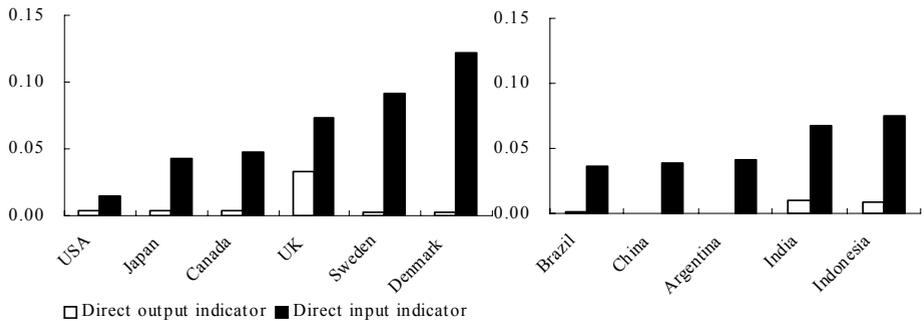
**Table 6: Ranked sectors of the pull effects of the real estate sector in China: 1997-2002**

Rank	1997		2000		2002	
	Sector	Value	Sector	Value	Sector	Value
1	Finance & insurance	0.0459	Finance & insurance	0.0916	Finance & insurance	0.0765
2	Construction	0.0388	Construction	0.0679	Construction	0.0387
3	Non-metallic mineral products	0.0387	Other Business Activities	0.0376	Other Business Activities	0.0322
4	Social & personal services	0.0136	Non-metallic mineral products	0.0325	Hotels & restaurants	0.0144
5	Manufacturing nec; recycling	0.0111	Electrical machinery & apparatus	0.0178	Non-metallic mineral products	0.0123

Finance & insurance sectors keep the first rank for input into the Chinese real estate sector. Its direct input indicator is constantly above 0.4 and peaked 0.9 in 2000. That is because real estate development and consumption need a lot of capital, which is a vital factor of this industry. The development enterprises as well as consumers need the aid from finance systems. So the finance sector is connected with the real estate sector through the whole process. Another major input role is the construction sector. The various real estate products, such as housing, office, industrial, are all built by the construction sector. The real estate sector has a strong pull effect on the construction sector. In addition, the non-metallic mineral products sector, the electrical machinery & apparatus sector, the hotels & restaurants and other business services ranked higher than other economic sectors in this period.

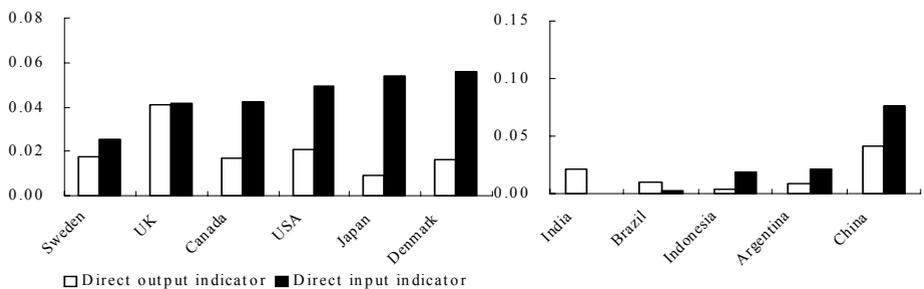
In fact, the push and pull effects of the real estate sector to other sectors are similar in different economies. The wholesale & retail trade sector and the finance sector have a high attractiveness to the real estate sector. And the input from the finance sector and the construction sector to the real estate sector is larger than other sectors. Figure 4 shows the direct output indicator and direct input indicator of the construction sector to the real estate sector. Most considered countries have a higher value of direct input shares than China (0.387). Furthermore, the construction sector's direct input indicator to real estate is much higher than its direct output indicator in every considered country. It shows that the real estate sector's pull effect to the construction sector is greater than the push effect.

**Figure 4: Push and pull effects of real estate to the construction sector after 1998**



The direct output and input indicators of the finance & insurance sector to the real estate sector are demonstrated in Figure 5. The direct input indicator is 0.0765 in China in 2002, which is the highest among the eleven selected countries during this period. The direct output indicator of financial sectors of China is also larger than the others at a value of 0.418. The possible reason may be that the financing channel of the real estate sector in China is narrow. Bank credit is the main channel for Chinese real estate enterprises. Other means of financing, such as equity capital, bonds and investment trust, account for a very small proportion of cases (Zhao et al., 2006).

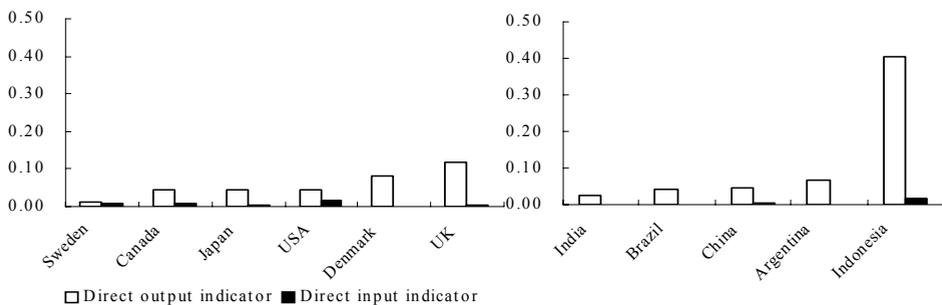
**Figure 5: Push and pull effects of real estate to the finance & insurance sector after 1998**



The buyers in the real estate sector heavily depend on bank loans. In fact, bank loans to the industry in China have gradually increased since 1998. In 2003, the development loan volume is 3.2 times higher than in 1998, and the consumption loans grew dramatically to 34.5 times as much as they were in 1998 (Zhao et al., 2006).

Figure 6 reflects the push and the pull effects between the real estate sector and the wholesale & retail sector. The wholesale & retail trade sector's demand for real estate is significantly larger than its input to real estate in all the eleven countries. It implies that the wholesale & retail trade has an extremely strong gravitation to the real estate sector. In other words, the increasing of the wholesale & retail sector's intermediate demand may lead to a larger output of the real estate sector.

**Figure 6: Push and pull effects of real estate to the wholesales & retail trade sector after 1998**



## CONCLUSION

Applying the recently published OECD input-output database to calculate and compare, this paper mainly analyzed the increasing role of the Chinese real estate sector after the introduction of new reform policies in 1998. According to the data from three IO tables of China (1997, 2000 and 2002), it shows that the new policy has deeply affected the input and output system of the Chinese real estate sector. As a result, its contribution to consumption, fixed capital formation and employment has grown dramatically. Through this period, the share of the real estate sector in GNP and GNI has become one of the most important sectors in the Chinese economy. An international comparison also proves the upward trend of the Chinese real estate sector during this period. However, its development level is still lower than all the OECD countries and most of the non-OECD countries. In other words, the real estate sector in China still has a huge potential opportunity for development.

The push and pull effects of the Chinese real estate sector were also discussed. There was an obvious fluctuation during the reform process. The sector's pull effect descended as the increasing final demand over the given time period. After 1998, the pull effect of the real estate sector, namely industrialization levels, had a slightly upward trend. Following the formation of the real estate market in China, the sector's service role has strengthened. Similarly, in other selected countries, for real estate, the push effect is larger than pull

effect. It is wise to promote the economy and raise demand to develop the real estate sector. It should be noted that both of its direct forward and backward linkages' ranks, which represent real estate sector's direct push and pull, are lower than the other sectors in every considered country. Considering the inter-sectoral dependence, the finance sector, the construction sector and other manufacturing sectors are always the most important intermediate input source of the real estate sector in China. On the other hand, the products and services of the Chinese real estate sector are mainly demanded by the wholesale & retail trade sectors, financing and other service industries. It should be noted that the real estate sector in China depends on the finance sector more than any other selected countries. It implies potential and ongoing financial risk.

Nevertheless, direct linkage indicators can just reflect the real estate sector's direct impact on national economy. More study, both focused on the direct and indirect impact of this sector, will further define the role of the real estate sector in the China economy based on the structural analysis.

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