

Government Regulation, Land Marketization and Excess Capacity

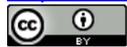
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Abstract

This paper discusses the reason of firm excess capacity in China in the aspect of marketization under government regulation, by using the data from World Bank China-enterprise survey 2012 to do empirical study of the relationship between obstacle of accessing land, land marketization and capacity utilization. According to the results, there is a positive correlation between levels of obstacle to access land firm capacity utilization. And the relationship between land marketization and capacity utilization is inverted U shape. When land marketization rate is 49.00%, firm capacity utilization is maximized. This implies that too low or too high land marketization rate will lower obstacle for firms to access land, resulting in excess capacity. In China, there is huge difference between land marketization rates in different regions. Especially, land marketization rates in developed regions are comparably lower, which means level of obstacle to access land is low in China for most firms. This is one key reason for China to suffer from excess capacity. Therefore, the government should formulate proper regulation policies to control land, in order to increase land marketization rate and obstacle to access land. Thereby, enterprise investment can be coordinated; capacity utilization can be improved; and the problem of excess capacity can be relieved.

Keywords

Government Regulation, Land Marketization, Over Investment, Excess Capacity

1. Introduction

After the Chinese economic reform, China's economy grew rapidly. However, China's economy is suffering from excess capacity at the same time. The capacity utilization of China is always lower than developed countries. After the economic crisis in 2008, the capacity utilization rate of China even dropped to 60% [1]. In the new of excess capacity, not only traditional industries like steel, cement, electrolytic aluminum, and plate glass,

but also emerging strategic industries like photovoltaics and wind-power equipment are involved. As the problem of excess capacity has more and more impact on China's economy, scholars are paying more attention to this problem and the solutions of the problem.

To solve the problem of excess capacity, it is vital to find the cause of the problem. The new excess capacity happened after the government released the 4-trillion fiscal stimulation plan during the 2008 economic crisis. It is possible that over investment of firms due to slack fiscal and monetary policies is the reason of this new excess capacity. Among all the factors firms invest, land is one of the most important. Meanwhile, land is also one of the factors that government policies have a great impact on. Therefore, it is important to discuss the impact of factor land on excess capacity, when we try to figure out the relationship between the fiscal stimulation plan and excess capacity.

This paper analyzes the relationship between the obstacle for firms to access land, urban land marketization level and capacity utilization, by using micro data of firm level, from an aspect of government land regulation, to study the impact of land on corporate behavior empirically.

2. Theory Mechanism

2.1. The Cause for China's Excess Capacity

Stiglitz, Spence *et al.* analyze the reason of excess capacity from the aspect of industrial organization. When the economy is booming, firms will invest more. However, when demand decreases, it is possible that firms may not sell the idle factors immediately because of cost and specificity [2]. Especially when there are potential entrants, incumbent firms will pose credible threat by investing in excessive production capacity strategically; increasing the entry barriers and preventing potential entrants enter [3]. The industrial structure characteristics with low entry barrier and high exit barrier will also result in over entry, which could lead to excess capacity [4] [5].

Zhang *et al.* promote ideas about explanation of China's excess capacity from different aspects considering special conditions of China. According to Zhang and Ma *et al.*, in the transition period of the economy, the market system is not complete. The soft budget constraint in the public ownership system and local government influencing firm investment in the incomplete market lead to over allocating of resources in some industries. This results in lower investment cost for firms and then excess capacity [6]-[9]. From the aspect of government offices promoting stimulation, Jiang and Cao *et al.* believe that in the political tournament, local government officials are not willing to cooperate, but only care about their relative precedence over their competitors. The competition between local governments leads to over subsidizing for firms. These subsidies from local government distort factor prices, thereby stimulating over investment of firms, resulting in excess capacity [10]-[12]. Based on the Wave Theory, Lin believes that the acknowledgement of developed countries' successful experience will lead to common knowledge in developing countries about the next emerging industries. If the number of new entrants is unknown, excess capacity is likely to happen due to following strategy [13] [14].

The other point of view holds that fiscal stimulation plans are important reasons for decreasing industrial capacity utilization in China. In the country reports 2012 from IMF, the industrial capacity utilization rate in China, which is only slightly lower than 80% before, dropped to 60% after the government released the 4-trillion fiscal stimulation plan in the 2008 economic crisis [1]. A large scale fiscal plan increases government expenditure on one hand, and decreases the cost for firms to access capital. With a lower cost for resources, firms are stimulated to invest more and build production capacity. Local government has the motivation to loosen regulation and encourage firms to build production capacity in order to obtain high growth rate of local GDP [15]. Based on the simultaneity of the fiscal stimulation plan and the excess capacity, we have reasons to deduct that the 4-trillion fiscal simulation plan is one of the important reasons for the excess capacity in the recent years.

2.2. The Land Market System and Government Regulation of Land in China

In China, the land ownerships in urban and rural area are different. In the rural area, land belongs to collectivity, while in the urban area, land belongs to the state. In the cities, primary and secondary land markets are founded during the land using system reformation. In the rural area, the only legal way to transform rural collective land into urban land is land expropriation and requisition. Based on this rules, the China land market can be approximately divided into rural land market, urban land market and rural land transformation market. This separate structure of land market leads to separation of space structure and value of land [16], thereby loss of efficiency

[17].

The primary urban land market is the market for land use right transfer. The state, as the owner of urban land, transfers the use right to the land users in this market. Limited period compensating transfer of state-own land and leasing land use right are two major forms of land exchanging behavior in the market. The major trading patterns of the primary urban land market include agreement, bid, auction, listing, allocation and rent. The secondary urban land market is the circulation market of land use right. Transfer, lease and pledge are the major trading patterns of the secondary urban land market. Usually, the secondary urban land market in China is regard as a relatively complete market, where both sides of deal can reach an agreement and trade freely [18]. This paper concentrates on the primary urban land market, because the two sides of deal in this market are the government and the firms. It is obvious that there is government regulation in the primary urban land market. And these government regulations might influence the behavior of micro firms.

The government regulation of land resources happens in the process of land marketization. It influences the level of land marketization. And the difference of land regulation level of different local government results in difference land marketization level of different cities.

2.3. Government Land Regulation and Excess Capacity

Recently, because of the new excess capacity, many scholars in China studied the cause of excess capacity from the aspect of land factor.

Huang *et al.* [19] did empirical study about the relation between land price distortion and firm over investment by using China industrial firm data and city land price data. The research found out that the distortion of industrial land price due to land regulations has a promoting effect towards firm over investment, which is the micro foundation of excess capacity. This promoting effect differs for different firms with different ownership and in different industries.

Gan *et al.* [20] discussed the relationship between access of resources and capacity utilization, while discussing the relationship between terms of local government officials and excess capacity. This paper analyzed two factor markets -land market and financial market. The result turned out that, when the obstacle of accessing land and capital is low, in other words the cost is low; firms have the motivation to build production capacity, which leads to decreasing capacity utilization and excess capacity.

From the researches above, we can conclude that there is some relationship between land prices, land access and excess capacity.

2.4. Theoretical Hypothesis

In the light of analysis above, we can obtain this theory framework (Figure 1).

The land market structure of China determines that the local governments can largely regulate the trade of land factors. These regulations will influence the level of land marketization. When there is less administrative control from local governments, the land market is closer to perfect competition. Both sides in the deal can trade land freely in the land market. Thus, the level of land marketization is higher. Oppositely, when there is more land regulation from local governments, the land market is closer to government monopoly. In the deal, both sides will be regulated by administrative controls. For example, land buyers may only buy land from land sellers with acquiring administrative approval from local government. Thus, the level of land marketization is lower.

Inappropriate level of land marketization, e.g. too high or too low, leads to low obstacle level of land access. This is because when land marketization level is high and land market is close to perfect competition, firms can buy land from the land market freely as long as they have enough capital. Then for firms with larger scale, earlier establish time and more capital, it is easier to access land resources; in other words, the obstacle to access

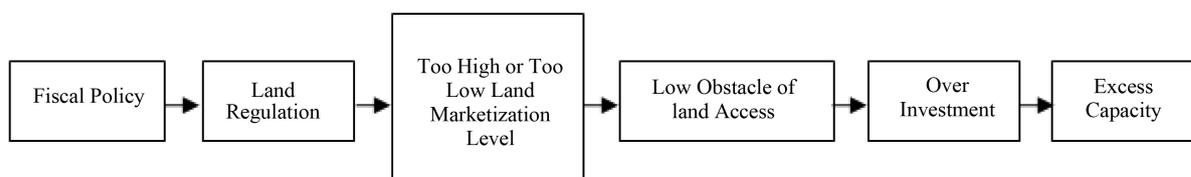


Figure 1. Theoretical hypothesis framework.

land is lower. However, when land marketization level is low, local government almost monopolizes the land market. In order to promote local economy, local government will provide land to firms with a very low price to attract investment in the local area. In this way, firms will easily access land. The cost and obstacle of accessing land are both low.

Low obstacle level of access land implies that the cost of acquiring land is low for firms. This cost includes not only the price firms pay for the land, but also the transaction cost of applying for administrative approval and bargaining with land seller. Firms tend to over invest and build production capacity due to low cost of land resources. And this leads to excess capacity.

This paper proposes a theoretical hypothesis that fiscal policy influences the degree of land regulation, thereby leads to excess capacity. Government land regulation, which is affected by fiscal policy, has impact on the land marketization level. Inappropriate high or low level of land marketization might cause low obstacle level of accessing land, which stimulates firms to over invest and causes excess capacity. The following part of this paper will verify this hypothesis empirically.

3. An Empirical Study Base on China-Enterprise Survey

3.1. Model Setting and Variable Setting

These empirical models verify the impact of government land regulation on excess capacity from the aspects of land resources accessing and land marketization level. In the end, there is a robustness test about the relation between land resources accessing and land marketization level.

Model (1) verifies the impact of land access on excess capacity. The model controls the effect of industry. The setting of Model (1) is as follow:

$$cu_i = \beta land_i + \gamma C + industry_j + \varepsilon_i \quad (1)$$

In the Equation (1), i represents different firms. j represents different industries. Dependent variable cu is the capacity utilization rate of firms. Major independent variable $land$ is the obstacle level for firms to access land. C is a series of control variables. $industry_j$ is the industry dummy variable. ε_i is the stochastic error. The control variables include: firm age $lifirmage$, firm scale $Intotalsale$, firm export $export$, firm human capital $educ$, firm capital per labor lnk , capital city dummy $capital$, city dummy $city$.

Model (2) verifies the impact of land marketization rate on excess capacity. In the light of theoretical analysis, it is very likely that the relationship between land marketization level and firm capacity utilization rate is not linear. Therefore, there is quadratic term verification in Model (2). The setting of Model (2) is as follow:

$$cu_i = \beta_1 landm_i + \gamma C + industry_j + city_k + \varepsilon_i \quad (2-1)$$

$$cu_i = \beta_1 landm_i + \beta_2 landm_i^2 + \gamma C + industry_j + city_k + \varepsilon_i \quad (2-2)$$

In the Equation (2-1) and (2-2), i represents different firms. J represents different industry. K represents different cities. Dependent variable cu is the capacity utilization rate of firms. Major independent variable $landm$ is the urban land marketization level. The control variables are the same as Model (1).

At last, we verify the impact of urban land marketization level on obstacle level of land access, to guarantee the robustness of the results. In Model (3), except that the dependent variable is land—the obstacle level of land access, the model setting, independent variable and control variables are the same as Model (2). There is also quadratic term verification in Model (3). The setting of Model (3) is as follow:

$$land_i = \beta_1 landm_i + \gamma C + industry_j + city_k + \varepsilon_i \quad (3-1)$$

$$land_i = \beta_1 landm_i + \beta_2 landm_i^2 + \gamma C + industry_j + city_k + \varepsilon_i \quad (3-2)$$

3.2. Description of Data

The capacity utilization rate of firm is major dependent variable. Capacity utilization rate is defined to measure the difference between real output and the optimal production capacity in the long term equilibrium. It is the most direct index to evaluate the condition of capacity utilizing. In this paper, capacity utilization rate is the proxy variable of excess capacity. The data of capacity utilization rate, which represent the ratio of real output to

Table 1. Sample data description.

Variable	Variable Explanation	Sample Size	Mean	Standard Deviation	Minimum	Maximum
<i>cu</i>	Capacity utilization rate	1691	86.797	10.765	0.000	100.000
<i>land</i>	Obstacle of land access	2841	0.618	0.806	0.000	4.000
<i>landm</i>	Land marketization rate	2848	50.531	11.792	23.540	68.390
<i>lnfirmage</i>	Firm age	2766	2.429	0.522	0.000	4.890
<i>Intotalsale</i>	Firm scale	2840	16.709	1.759	4.605	24.412
<i>export</i>	Firm export	2844	6.791	20.264	0.000	100.000
<i>educ</i>	Firm human capital	2848	60.704	30.094	0.000	100.000
<i>lnk</i>	Firm capital per labor	1259	11.151	1.585	0.415	19.584
<i>capital</i>	Capital city dummy	2844	0.489	0.500	0.000	1.000
<i>city</i>	City dummy	2848	13.025	7.312	1.000	25.000
<i>industry</i>	Industry dummy	2848	39.503	21.033	15.000	100.000

the max output using all resources, is based on the World Bank China-enterprise survey 2012. This data set contains micro data of fiscal year 2011 of more than 2000 firms in 25 cities (municipalities) in China.

The obstacle level of land access *land* is the major independent variable in Model (1). The data of the obstacle level of land access, which are also micro data, are also from the World Bank China-enterprise survey 2012. In the survey, there are 6 options to this question, including “no obstacle”, “minor obstacle”, “moderate obstacle”, “major obstacle”, “very severe obstacle” and “do not know”. When processing the data, the former 5 options are scored as 0 - 4; choosing “do not know” and not applying are recorded as missing.

The urban land marketization rate *landm* is the major independent variable in Model (2). In this paper, the proxy variable for urban land marketization level is the land marketization rate of urban primary land market. We calculate the land marketization rate of urban primary land market of the 25 cities involved in the China-enterprise survey, using Qian and Mou’s method [18] (2012) when they evaluated the land marketization rate of China. The data we use to calculate the land marketization rate of urban primary land market are from China Land and Resources Almanac 2012.

The other control variables are as follow. The firm age variable *lnfirmage* is the logarithm of the difference between year of the report (2011) and establish year of firm plus 1. The firm scale variable *Intotalsale* is the logarithm of the total sales of 2011 including product and service. The firm export variable *export* is the ratio of direct export to total sales. The firm human capital variable *educ* is the percentage of worker with education level higher than high school. The firm capital per labor variable *lnk* is the logarithm of fixed assets per worker. The capital city dummy variable *capital* is 1 for capital cities, and 0 for otherwise. *city* is the city dummy variable. *Industry* is the industry dummy variable. All the data of the control variables are from the World Bank China-enterprise survey 2012.

Table 1 lists the statistic description of the sample data. The mean of firm capacity utilization rate is 86.79%, which is not low. The obstacle level for firms to access land is 0.618, implying that it is very easy for firms to access land. The mean of urban land marketization rate is 50.531%. The city with the highest land marketization level is Nantong (68.39%), while the lowest is Wenzhou (23.54%). The difference between them is 44.85, implying that there are large difference of land marketization level among different regions. Importantly, most cities with lower land marketization rate than average are in the east-coastal developed area of China, including Beijing, Shanghai, Guangzhou, Shenzhen, Foshan, Nanjing, Hangzhou and Wenzhou etc.

3.3. Results of Regression

This paper uses the OLS method to estimate the model. The ordinary leastsquare (OLS) is a way to estimate the

coefficients of independent variables. And when the conditions-equal error term variances and uncorrelated error terms with independent variables-are satisfied, OLS is unbiased. OLS is the most basic and commonest way to estimate an econometrics model.

Line (1) in **Table 2** list out the regression result of Model (1). The result shows that there is a highly significant positive correlation between the obstacle degree for firms to access land and firm capacity utilization rate, which suggests that the easier firms to access land, the lower the capacity utilization rate would be. In China, local governments often offer preferential policy to attract investment to develop local economy. In the land market, local governments can help firms to acquire land more easily via reducing administrative procedure for examination and approval, even lowering the price of land. More accessible land factor will stimulate firms to invest more, not only on land, but also other factors. Haphazard investment, extending production and building capacity lead to low capacity utilization rate and excess capacity.

The other variables, such as firm age, firm scale, firm capital per labor, location of the firm, whether the location is a capital city, are all significantly positive correlated to capacity utilization rate. The firm export and firm human capital are positive correlated to capacity utilization rate, but the correlation is not significant. This outcome suggests that the scale and the location of firm have strong influence on capacity utilization rate.

The outcome of Model (2) is listed in line (2-1) and line (2-2). The regression rejects the null hypothesis that the correlation between land marketization level and capacity utilization rate is linear. Then we choose the

Table 2. Regression results.

	<i>cu</i>			<i>land</i>	
	(1)	(2-1)	(2-2)	(3-1)	(3-2)
<i>land</i>	1.770*** (0.377)				
<i>landm</i>		0.333 (0.205)	4.116*** (1.365)	0.025* (0.014)	0.327*** (0.093)
<i>landm</i> ²			0.042*** (0.013)		0.003*** (0.001)
<i>lnfirmage</i>	1.206** (0.582)	0.727 (0.556)	0.727 (0.556)	-0.017 (0.038)	-0.017 (0.038)
<i>Intotalsale</i>	0.397** (0.186)	0.365** (0.181)	0.365** (0.181)	0.035*** (0.012)	0.035*** (0.012)
<i>export</i>	0.019 (0.014)	0.036*** (0.013)	0.036*** (0.013)	0.001 (0.001)	0.001 (0.001)
<i>educ</i>	0.001 (0.011)	0.013 (0.012)	0.013 (0.012)	0.002** (0.001)	0.002** (0.001)
<i>lnk</i>	0.577*** (0.190)	-0.033 (0.210)	-0.033 (0.210)	-0.004 (0.014)	-0.004 (0.014)
<i>capital</i>	1.446** (0.624)	0.519 (1.449)	0.519 (1.449)	-0.187* (0.098)	-0.187* (0.098)
<i>city</i>	0.144*** (0.043)				
constant	65.804*** (3.787)	63.639*** (10.518)	19.436 (33.767)	0.107 (0.714)	6.525*** (2.295)
<i>city</i>	N	Y	Y	Y	Y
<i>industry</i>	Y	Y	Y	Y	Y
<i>N</i>	1200	1202	1202	1210	1210
<i>R</i> ²	0.067	0.181	0.181	0.344	0.344
<i>adj. R</i> ²	0.045	0.146	0.146	0.315	0.315

Note: ***, **, *, illustrate that P values on the significant level of 1%, 5%, 10% is significant; The standard deviation of variables are shown in brackets.

non-linear model (2-2) to analyze the relation between these two variables. The result shows that the relationship between land marketization level and capacity utilization rate is invert-U shaped. The firm capacity utilization rate will be optimal, when the urban land marketization rate is at its 49.00%. When the land marketization rate is low, the capacity utilization rate rises as the land marketization rate rises. And when the land marketization rate is high, the capacity utilization rate drops as the land marketization rate drops.

The land marketization rate is low when there is more administrative intervention from local government. To develop local economy, local government attracts investment with easy access to land. Then the transaction cost for firms to acquire land, or even the real cost of land will be low. Firms are stimulated to over invest, hence causing low capacity utilization rate and excess capacity.

However, land marketization rate higher than the optimal level will also cause excess capacity. When there is few government regulations and the land marketization level is high, which means the land market is relatively complete, firms and land sellers can trade land freely in the market. Firms can buy land from the land market easily without suffering from complicated administrative examination and approval procedure, as long as they have enough money. The obstacle for firms to access land is low. Therefore, firms in traditional industries, like steel, with large scale and sufficient money can acquire land from the land market easily, while firms in newly emerging industries may not buy land so easily due to lack of money. As a result, traditional but declining industries invest more to build capacity. This also causes excess capacity.

Model (3) is the robustness test of Model (1) and (2). The regression results are showed in line (3-1) and (3-2) in **Table 2**. Similarly to Model (2), the outcome rejects the null hypothesis that the relationship between land marketization level and obstacle level of accessing land is linear. So Model (3-2) is accepted. The result shows that the relation between urban land marketization level and obstacle level of land access is also inverted-U shaped. When land marketization rate is 54.50%, the obstacle of land access is highest. This result is essentially the same as Model (1) and (2). Thus, we can conclude that the outcomes of Model (1) and Model (2) are robust.

4. Conclusions

1) Land Factor Has Significant Impact on Capacity Utilization

The result of empirical study shows that the difficulty of accessing land and the land marketization level influence capacity utilization rate, implying that the regulation to land factor has significant impact on excess capacity. The fiscal stimulation plans might lead to excess capacity through leasing of land regulation. Therefore, to solve the problem of excess capacity and increase capacity utilization rate, government can start from improving the land system.

2) Most Cities with Land Marketization Level Lower than Average Are Located in the East-Coastal Developed Area, though the Average Land Marketization Level of China is Moderate. The Low Land Marketization Level of These Developed Cities is the Cause for Excess Capacity in China

The average of land marketization level of China is 50.53%, which is very close to the optimal 49.00% to maximize capacity utilization rate. This implies that the land marketization rate of China as a whole is moderate. However, there is huge difference among land marketization rate in different cities, which means that the difference among capacity utilization rate of firms in different cities is also huge. Almost all of the cities with land marketization level lower than average are located in the east coast area, where most of China's GDP is generated from. These cities are of important status in China's economy, hence, their excess capacity, due to low land marketization level, results in the excess capacity of the whole economy.

3) Appropriate Control and Regulation of Land Factor Should Be Beneficial for Improving Capacity Utilization Rate and Easing the Problem of Excess Capacity

Both too low and too high land marketization rate will lead to excess capacity. Thus, appropriate government land regulation is essential for building appropriate production capacity. Local governments should develop land system and regulate land resources moderately, to keep the land marketization rate around the optimal point, hence increasing the difficulty for firms to access land, encouraging firms to invest more rationally, improving capacity utilization rate and relieving the problem of excess capacity.

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