

고정 자산이 기업 실적에 미치는 영향 - 중국에서 성장 제조업 회사들의 증거

The Influences of Fixed Assets on Corporate Performance - Evidence from Manufacturing-listed Companies in China

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요약

제조업은 국가 경제 성장의 핵심 산업이다. 제조 기업의 내부 문제를 분석하면 제조 기업이 직면 한 어려움을 해결하고 제조 기업의 전반적인 성과를 향상시킬 수 있으며, 이 연구는 고정 자산 측면에서 부동산과 기업 성과 간의 관계를 탐구하려고 시도한다. 샘플 데이터는 2009년부터 2015년까지 심천 및 상하이 주식 시장에 상장된 1,546개의 제조업체로 구성되어 있다. 본 연구에서 고정 자산의 규모는 기업 성과와 유의미한 부정적 관계가 있으며, 고정 자산의 품질은 기업 성과와의 약한 긍정적인 관계를 가지고 결과는 안정적이지 않으며, 고정 자산의 성장률은 기업 성과에 크게 영향을 미치며 효과는 긍정적이다.

■ 중심어 : | 고정자산 | 제조회사 | 기업 실적 | 중국상장회사 |

Abstract

Manufacturing is a pillar industry for national economic growth. Analyzing the internal problems of manufacturing enterprises can solve the difficulties faced by manufacturing enterprises and improve the overall performance of manufacturing enterprises. This study selected 1,546 listed manufacturing companies in Shenzhen and Shanghai stock markets from 2009 to 2015, and empirically analyzed the relationship between fixed assets and corporate performance by using the fixed effect model and the two-way fixed effect model. The study finds 1) the scale of fixed assets has a negative effect on corporate performance. 2) the quality of fixed assets has a weak positive relationship with fixed assets. 3) the growth rate of fixed assets impacts corporate performance positively.

■ keyword : | Fixed Assets | Manufacturing Companies | Corporate Performance | Chinese Listed Companies |

I. Introduction

From the point of Zhang.K.H (2015), China is the biggest factory of manufactured goods and manufactured exports in the world[1]. There are

3337 listed companies in A-share Market in China by the end of 2016, of which 1832 are listed manufacturing companies, accounting for 60% of the total market. (data from CSMAR database) As the basic industry for the

접수일자 : 2020년 12월 21일
수정일자 : 2021년 01월 13일

심사완료일 : 2021년 01월 13일
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operation of the national economy, the manufacturing industry is the guarantee for maintaining social production and promoting the development of the national economy.

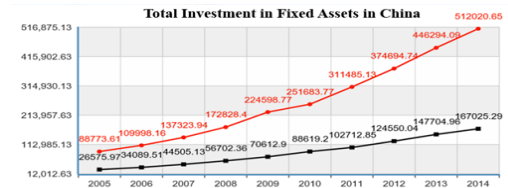
To quote the Chelsea Levinson (2018), Manufacturing industry refers to those industries which involve in the manufacturing and processing of items and indulge in either creation of new commodities or in value addition[2]. Manufacturing level is also used as a vital reference factor to distinguish developing countries and developed countries.

Fixed assets include buildings, land, machinery, transportation and other assets related to production and operation. According to the statistical data of National Bureau of Statistics in China (the [Table 1]), the total investment in the fixed assets rose from 88.77 billion dollars to 512.02 billion dollars, which amounts to a 566% increase in China's fixed assets investment field in the past ten years. It also shows that fixed assets investment in Chinese manufacturing industry account for nearly 30% of the total fixed assets investment. Meanwhile, by analyzing the purposes of fixed assets investment, we find that the real estate investment is the most single important part of the fixed assets investment, which accounted for over 60% each year. The results are shown in [Table 2].

Along with China's rapid economic development, the production scale of enterprises also increases by leaps and bounds, especially in the area of investment in fixed assets. The fixed assets is an indispensable part of total property, its size, efficiency, quality, and so on, all have a direct impact on the enterprise. So enterprises has begun to realize the importance of fixed asset management.

Strengthening fixed assets management has become an urgent problem to be solved.

Table 1.



- Total Investment in Fixed Assets in the Whole Country(100 million yuan)
- Total Investment in Fixed Assets in the Whole Country, Manufacturing(100 million yuan)

Data Source: China Statistical Yearbook

Table 2. Structure of Real Estate Investment in Fixed Investments in China

Time	Real estate	Purchase of Equipment and Instruments	Other Items
2005	60.13%	24.13%	15.73%
2006	60.71%	23.24%	16.05%
2007	60.82%	22.99%	16.19%
2008	60.73%	23.49%	15.78%
2009	61.78%	22.64%	15.58%
2010	61.82%	21.39%	16.79%
2011	64.27%	20.92%	14.81%
2012	65.02%	20.74%	14.24%
2013	66.87%	20.41%	12.73%
2014	68.32%	19.73%	11.96%
Average	63.05%	21.97%	14.99%

II. Literature Review

Studies on the influence of fixed assets on corporate performance are few, most are focus on the relationship between asset structure and corporate performance.

1. Research on Asset Structure

Michaelas et al. (1999) conducted an empirical study on the relationship between corporate assets and debt levels[3]. The study found that fixed assets and inventory of companies will have an impact on liabilities. The higher the ratio of fixed assets and

inventory, the higher the company's debt ratio. If a company intends to obtain higher returns, it needs to make a reasonable allocation of the ratio of assets and liabilities. Öcal et al. (2007) Studied whether factors such as asset structure, capital structure, liquidity and profitability, activity efficiency, profit rate and growth, will affect economic changes in Turkey. The results show that all these five factors are sensitive to economic changes[4]. Hartman (2004) proposed an effective optimization method for asset replacement through stochastic dynamic programming, and suggested that relevant decisions about asset replacement should be made on the basis of asset utilization[5]. Cohen (2003) studied the optimal capital structure of financial institutions. It is concluded that financial institutions and general enterprises have significant differences in the treatment of capital structure. Due to the existence of prescribed capital restrictions in financial institutions and the interdependence of creditors and debtors, under the effect of leverage the net asset gains, it is difficult to arrive at an optimal capital structure[6].

2. Research on the Impact of Asset Structure on Corporate Performance

Agiomirgianakis et al. (2006) took the Greek manufacturing industry as a sample and studied the factors affecting the company's rate of return. It is concluded that the company's operating conditions, sales growth rate, asset management efficiency, etc. all have an impact on the company's rate of return[7]. Booth, Laurence, and Asli et al. (2001) collected sample data from 10 developing countries to study the influencing factors of capital structure, and found that the influencing factors in developing

countries are similar to those in developed countries. That is, when the capital structure of companies in developed countries is affected by certain factors (such as company growth, etc.), the capital structure of companies in developing countries is often affected by such factors[8]. Bevan and Danbolt (2001) Use 7-year data from 1054 companies in the UK to study the influencing factors of capital structure. They subdivide capital composition into different types of long-term liabilities and short-term liabilities, and use growth opportunities, company size, profitability, and asset tangibility that represent company characteristics as explanatory variables to examine its impact on capital structure. They found that the research using mixed OLS did not get results consistent with the conclusions of most capital structure studies[9]. Hammes(2003) studied the relationship between corporate debt and corporate performance in different countries. They found that the company's debt level and corporate performance are negatively correlated[10].

Czyzewski and Hicks (1992) studied the impact of asset structure on corporate performance. It turns out that companies with a higher return on assets have more sufficient cash holdings, higher asset concentration, and a higher proportion of other current assets in total assets. However, fixed assets and inventories are relatively weak and account for a low proportion[11].

Rajan and Winton (1995) found that there is a positive correlation between tangible assets and financial leverage. The reason is that tangible assets act as collateral to reduce the agency cost of creditors[12]. Based on the financial data of small and micro credit enterprises in

the sub-Saharan region from 1995 to 2004. Anthony (2007) concludes that the debt leverage of will have a positive effect on the company's benefits[13]. Bahaman (2011) uses the financial data of UK listed companies from 1991 to 2001 to study the impact of the company's financing level on company growth. The shareholder's return on funds, profit rate, and return on total assets are selected to measure the company's growth. Through empirical analysis, it is concluded that the company's financial leverage has a negative impact on the company's growth[14]. Mahfuzah Salim and Raj Yadav (2012) selected 237 listed companies in Malaysia. The time period is from 1995 to 2011. The empirical analysis shows that if the company's debt leverage is higher, the company's development is worse[15]. Chadha S and Sharma A K. (2015) selected 422 Indian manufacturing companies. The time period is from 2003 to 2012. Through regression analysis, the empirical results show that the company's return on equity and financial leverage are negatively related, but There is no significant correlation with return on total assets and Tobin's Q [16]. Demsetz and Vllalonga (2001) use the financial data of 223 sample companies in the United States. Using model regression, it is concluded that the proportion of tradable shares and Tobin's Q are positively correlated, and its expansion will significantly increase the value of the enterprise[17]. Panayotis Kapopoulos and Sophia Lazaretou (2007) analysis the financial data of nearly two hundred companies in Greece. The results shows that the low concentration of corporate equity will reduce the business performance of the company. It is necessary to maintain an appropriate proportion of the concentration of

shares, which will affect the companys' performance[18]. Keunkwan and Jihye (2011) conduct an empirical study on the relationship between Korean corporate management's shareholding ratio and corporate performance. The results show that when the management's shareholding ratio is less than 42%, changes in corporate insiders' shareholding will not have an impact on corporate value. However, when this proportion exceeds 42%, if the proportion continues to increase, the value of the enterprise will also increase[19]. Hoffmann (2014) studied the impact of corporate governance mechanisms in Chile on corporate value. Through empirical analysis, the equity concentration and corporate value of Chilean companies are "inverted U-shaped" phenomenon[20].

Bao, D. H (2004). focused on the relationship between inventory and company value. The company's inventory level is different, and the company value is also different. If a company's inventory is more scientific, reasonable, and can cooperate with company's operation, then the company's value will be greater[21].

Reyhani (2012) studied how the asset structure affects the performance of the receiving company through two sets of surveys. The results show that fixed assets have a significant positive impact on EBIT (earnings before interest and taxes)[22].

Papadogonas (2007) believes that new investment in fixed assets has a negative impact on the profitability in small-sized companies; but has no effect on the profitability of medium-sized companies; but has positively correlation with the profitability of the large-sized companies[23].

In previous studies, most of the research

focused to the capital structure, asset structure and ownership structure in the field of corporate performance. However, research on the impact of fixed assets on company performance is less. Therefore, this research tends to focus on the relationship between corporate performance and growth of fixed assets, the proportion of fixed assets, fixed asset turnover.

III. Data & Method & Hypothesis

1. Data

The original data in this research is from CSMAR database. All the companies used in the research:

- 1) are manufacturing listed companies;
- 2) went public before 2009, and continued to be listed till now.
- 3) for companies that issue both A shares and B shares, this research only uses A-share listed companies as research sample.
- 4) are non-ST firms. ST (special treated) firms refer to the listed firms with two consecutive annual losses
- 5) Companies whose data is not complete are also excluded from sample.

Given all the factors above, there are 1546 companies being selected in the research.

The period of empirical analysis in the research is from 2009 to 2015.

2. Variables selection and Models

2.1 The measurement of Corporate Performance

Herly (2011) thinks that the corporate performance can be showed by the financial statement provided by corporates. A company with good performance prefers to strengthen

management for the quality of financial statement[24].

The methods applied to measure corporate performance in the previous studies are generally divided into two types: Singer Index Approach and Comprehensive Evaluation.

Singer index approach refers to the method which only use one indicator to evaluate corporate performance. Indicator such as ROA (return on assets), ROE (return on equity), EVA (economic value added) and Tobin's Q are most commonly used by researchers.

Tobin's Q is the ratio between a physical asset's market value and its replacement value:

1) $Q < 1$ means the market value may be less than the replacement value. In other words, the market may undervalue the company. Entrepreneurs prefer to increase companies scales or build new companies through merger and acquisition rather than re-buy new products because of high price of procurement spending.

2) If Q is larger than 1, it would mean that the company's market value is bigger than company's replaced value. Investors prefer to re-buy new products because the procurement spending is relatively cheap. Therefore, less procurement spending can produce more investments.

3) $Q = 1$ means company's market is equal to replacement value.

Morck et al. (1988) suggests that Tobin's q ratio can be used to measure a company's value. Because intangible assets value and time value of money were considered so that the company's performance can be evaluated more scientific. So in this study, we use Tobin's q as dependent variable to measure corporate

performance[25].

2.2 The Measurement of Fixed Assets

1. Fixed assets ratio refers to the scale of fixed assets to firm's total assets.

Fixed assets represent the production capacity of an enterprise. If the ratio of fixed assets of the enterprise is too low, the ability of production and operation is limited, which will have a negative impact on the increase of labor productivity and the reduction of production costs, so that the profitability of total assets will be affected. While, if the ratio of fixed assets is too high, the liquidity of a company will be affected. At the same time, an appropriate proportion of fixed assets for production and non-production should be maintained. All fixed assets for production should fully meet the needs of production and operation, and fixed assets for non-production should be able to take service responsibilities. Excessive investment in non-productive fixed assets will lead to low utilization of fixed assets, which will reduce the quality of total assets and fixed assets.

2. In general, the high ratio of fixed assets turnover shows the efficient use of the fixed assets. The higher rate of turnover of fixed assets, less of turnover days, indicate that fixed assets are more efficiently utilized, more properly invested, and the structure is more reasonable. When the utilization efficiency of fixed assets is higher, the profitability of companies is stronger;

The formula of the index can be showed as following:

$$\text{fixed assets turnover} = \frac{\text{net sales}}{\text{average net fixed assets}}$$

3. The growth rate of fixed assets refers to evaluate the increase of investment on fixed assets. The amount of investment in fixed assets is directly related to the formulation of business benefits and development plans. Analyzing the impact of fixed asset investment on enterprise performance plays an important role in the development of the entire enterprise. It is of great significance to strengthen the management of fixed asset investment; control the excessively high investment rate; optimize the investment structure; and improve the investment efficiency. If the investment in fixed assets is too large, and the fixed assets cannot be fully utilized to bring benefits to the enterprise in time, it will cause an excessive financial burden on the enterprise, which is not conducive to the development of the enterprise; if the investment is too small to satisfy the need of an enterprise's production, it will also cause losses.

The formula of the factor is showed as follows:

$$\begin{aligned} & \text{the growth ratio of fixed assets} \\ & \frac{\text{the growth scale of fixed assets (the end of this year)}}{\text{the whole scale of fixed assets (the end of last year)}} \end{aligned}$$

2.3 Control Variables

5 control variables are selected to guarantee the accuracy and reasonability of the exploration. Control variables include debt to assets ratio, managerial ownership, financial leverage, the size of total assets and the growth

rate of total assets(see [Table 3]).

2.4 Model

Table 3. Variables List

Variable Type	Variable Name	Variable Definition/Calculation Methods.
Dependent variable	Tobinq	Tobin's q =market value/replacement value
Independent Variable	Fassetratio	Fixed assets ratio=fixed assets/ total assets
	Fassetturnover	Fixed assets turnover=net scale/average net fixed assets
	Fassetrise	Growth rate of fixed assets=growth scale of fixed assets/ whole scale of fixed assets
Control variable	Debttoassetratio	debt to asset ratio
	Lnglc	Lnglc=log (total size of management ownership of stock)
	financial leverage (Lev)	Lev=the change of earning per share of common stock/ Earnings before interest and tax rate of change
	Lntotalasset	Lntotalasset=log (the size of total assets)
	Totalassetrise	Totalassetrise=the growth ratio of fixed assets investment

3. Hypothesis

Hypothesis 1: If the scale of fixed assets is larger, then the corporate performance is better. The scale of fixed assets refers to the proportion of fixed assets in the total assets of an enterprise. The scale of fixed assets is directly related to whether the asset structure is reasonable, which will affect the profitability of the enterprise and the solvency of the enterprise.

Hypothesis 2: If the quality of fixed assets is higher, then the corporate performance is better. The quality of fixed assets directly affects the quality of business operations.

Hypothesis 3: If the investment of fixed asset is more, then the corporate performance is better. Fixed asset investment refers to the use

of a large amount of money for building houses, purchasing and installing equipment, constructing new fixed assets or upgrading existing fixed assets. Due to the large amount: long construction recovery period of fixed asset's investment, therefore, once the investment is determined, it is difficult to change it. After fully considering relevant factors, the increase in investment in fixed assets is conducive to improving the performance of the enterprise. While enterprises blindly invest in fixed assets without considering the feasibility, the level of corporate performance will be affected.

IV. Empirical Results

1. Data description

The [Table 4] shows the summary statistics of the dependent variable Tobin's q and all the other variables used in this study.

Table 4. Descriptive Statistics of Variables

Variable	N	Mean	Std. Dev.	Mn	Max
Tobinq	9340	2.561418	3.315822	0.082643	126.4984
Fassetratio	9325	0.1543332	0.1352284	0	0.829821
fassetturnover	9273	93.34908	4867.042	0.000146	446778.4
Fassetrise	9264	0.8869035	34.86984	-1	2705.743
debttoassetratio	9340	0.3665638	0.5687645	-0.002928	41.93938
Lnglc	7105	15.06494	3.757301	4.174387	20.9994
Lev	9340	1.344784	20.28424	-1479.226	856.6074
lntotalasset	9340	21.63624	1.155441	17.01851	26.96087
totalassetrise	9340	0.3723286	4.702802	-0.988815	372.3861

Tobin's q is used as performance measure in this study, which varies from 0.83 to 126.5 with mean average of 2.56 and standard deviation of 3.31. These statistical results show a great

disparity among the A-share listed manufacturing companies in their performance. It also reveals serious polarization problem exists in China's manufacturing industry.

The average ratio of fixed assets is 15.43%, it varies from 0 to 82.98%, which indicates a huge difference among companies' fixed assets score. The turnover ratio of fixed assets is used to reflect the quality of corporate performance. With a mean value of 93.34, and it varies from 0.0146% to 44677840%, which means the level of assets utilization and asset management is unequal among manufacturing companies. This result also indicates the inefficiency use of fixed assets. The growth rate of fixed assets, increases rapidly and continuously in the past 10 years in China. It varies from negative 100% to 270574% with a highest average value of 88.69%. It also reveals a great disparity among the raising investment in fixed assets.

2. Correlation Analysis

To avoid the problem caused by multi-collinearity, correlation test is essential in this study. Correlation analysis, as a valuable reference, directly judges the correlation among the corporate performance and each independent variable about the fixed assets. The correlation test is present in [table 5]

below.

The results show that Tobin's q(tobinq) has a negative relationship with the scale of fixed assets (fassetratio) and the correlation is 7.25%, has a positive relationship with fixed assets turnover(fassetturnover) and the growth rate of fixed assets(fassetrise), the correlation are 2.47% and 2.11%. The negative relationship between fixed assets ratio and Tobin's q reveals that the bigger the scale of fixed assets is, the poorer the corporate performance will be. Due to the low liquidity of fixed assets which can reduce the flexibility of company, so the business efficiency of company can be reduced. The positive correction of Tobin's q and fixed assets turnover indicates that, with high quality of fixed assets, the utilization of fixed assets becomes more effective. The correlation between growth rate of fixed assets and Tobin's q means that fast growth of fixed assets investment bring better performance.

As for the correlation between the corporate performance and control variables, we can see that growth rate of fixed assets(totalassetrise), Debt to asset ratio(debttoassetratio) and managerial ownership(glc) all have a positive relationship with Tobin's q. While the scale of total size and financial level has negative correlations with Tobin's q.

Table 5. Correlation Coefficient

	Tobinq	Fassetratio	Fassetturnover	Fassetrise	debttoassetratio	Lnglc	Lev	Lntotalasset	Talassetrise
Tobinq	1								
Fassetratio	-0.0725	1							
Fassetturnover	0.0247	-0.022	1						
Fassetrise	0.0211	-0.0153	-0.0011	1					
debttoassetratio	0.0979	0.0805	-0.0069	-0.0089	1				
Lnglc	0.1271	-0.1738	-0.0061	0.0076	-0.162	1			
Lev	-0.0031	-0.0089	-0.0003	-0.0005	0.011	-0.0071	1		
Lntotalasset	-0.3526	-0.0068	-0.0018	0.0035	0.0674	-0.2002	0.007	1	
Talassetrise	0.0673	-0.1549	-0.0011	0.0051	-0.054	0.1157	-0.0018	-0.029	1

More exact analysis is needed in the following study for accurate descriptions of the relationships among these variables.

3. Variance Inflation Factor

Table 6. Multicollinearity Test

Variable	VIF	1/VIF
Fassetratio	1.06	0.94623
Fassetturnover	1	0.999338
Fassetrise	1	0.999663
debttoassetratio	1.03	0.968626
Lnglc	1.11	0.904859
Lev	1	0.999702
Lntotalasset	1.05	0.956527
Talassetrise	1.03	0.966906
Mean VIF	1.03	

It can be seen from [Table 6] that since the maximum VIF is 1.11, which is much less than 10, there is no multicollinearity problem.

4. Multivariate Regression Analysis

4.1. Fixed Effects Model

Table 7. Fixed Effects Regression Models

Tobinq	Model1		Model2	
	coef.	Std. Err.	coef.	Std. Err.
Fassetratio	-2.02167***	0.5530009	-2.02167*	1.214743
fassetturnover	0.0000396*	0.0000231	0.0000396	0.0000535
Fassetrise	0.0033482**	0.0013814	0.0033482***	0.0006671
debttoassetratio	0.2007475***	0.065785	0.2007475	0.9118447
Lnglc	0.2888913***	0.0327129	0.2888913*	0.1587082
Lev	-0.0001992	0.001513	-0.0001992	0.0003376
Lntotalasset	-1.165538***	0.0782024	-1.165538**	0.5242364
Talassetrise	0.1013936***	0.0359242	0.1013936***	0.0316748
_cons	23.65459	1.641628	23.65459	9.51632
R2	4.66%		4.66%	

Notes: 1. *indicates significance at the 10% level.
2. ** indicates significance at the 5% level.
3. ***indicates significance at the 1% level.

Fixed effect model is one of the most frequently used models when it comes to panel

data analysis. That is because each company is independent, so missing variables which don't change over time may exist in sample data. The analysis result is shown in [Table 7].

The difference between Model 1 and Model 2 is cluster-robust standard error is considered in Model 2. Mitchell (2009) suggests that fixed effects model with cluster-robust standard error gives unbiased estimation and correct confidence intervals whether the fixed effect is permanent or temporary. For improving the robustness, fixed effect with ordinary standard error is used too.

In [Table 7] the R square of fixed effects model is 4.66%, it indicates that 4.66% of the variability of Tobin's q is explained by the three factors of fixed assets. F-test in Model 1 is 0.0000 which strongly rejects the null hypothesis: pooled effect model is superior to fixed effect model. Therefore, regression results of fixed effects should be adopted in this study.

When we see the relationships among related variables, fixed assets ratio has a significant negative relationship with Tobin's q with the coefficient of minus 0.02 in both two models, but the significance level is different. Fixed assets ratio is negative and significant at 1% level in Model 1 while it is negative and significant at 10% level in Model 2. Fixed assets turnover affects Tobin's q positively as we studied before, but the result is not significant in Model 2. It indicates that after considering auto-correction of the same company's disturbance term, the correlation of turnover ratio and Tobin's q becomes weaker. It might be because Model 2 fixes the defect of estimating the standard error in pooled effects model (Mitchell, 2009). Furthermore, the growth rate of fixed assets significantly affects Tobin's

q positive at 5% level in Model 1 and 1% level in Model 2.

Finally, as for control variables, the results reveal that Tobin's q has a positive relationship with debt to asset ratio, managerial ownership and the growth rate of total assets. The scale of total assets has a negative influence on Tobin's q and the influence is significant. Financial leverage has a negative influence on Tobin's q, but the result is not significant.

4.2. Two-way Fixed Effects Model

To find out whether time effect exists in fixed effects or not, the two-way fixed effects model is used in Model 3. This model analyzes time effect by quoting 6 time dummy variables from year 2010 to year 2015. The result of test for joint significance strongly rejects null hypothesis. Thus, two-way fixed effects model is advisable in this study. The regression results are showed as following [Table 8].

In [Table 8], R square is improved significantly after considering both individual effect and time effect, which indicates that considering time effect can optimize regression results in panel analysis. Fixed assets ratio has a negative significant relationship with Tobin's q at 5% level with coefficient negative 2.48393. Fixed assets turnover has a positive significant relationship with Tobin's q with coefficient 0.000036, but the results is not significant. The growth rate of fixed assets has a strong positive relationship with Tobin's q at 1% level.

As for control variables, debt to assets ratio, proportion of management shareholding and growth rate of total assets all have positive influences on Tobin's q, but only growth rate of total assets is significant. Financial leverage and total assets ratio have negative relationships

with Tobin's q, but only total assets ratio is significant.

Table 8. Two-way Fixed Regression Model

Tobinq	coef.	Robust Std. Err.
Fasstratio	-2.48393**	1.08643
fassetturnover	0.000036	0.000045
Fassetrise	0.003637***	0.000808
debttoassetratio	0.105748	0.864236
Lnglc	0.189196	0.13466
Lev	-0.000049	0.000419
Intotalasset	-2.54585**	1.011738
Talassetrise	0.217396***	0.075096
time2	0.451461***	0.115725
time3	-0.51477**	0.254405
time4	-0.01997	0.52911
time5	0.522162	0.615738
time6	1.231685	0.824938
time7	3.057231*	1.016079
_cons	54.29054	19.94896
R2	20.30%	

Notes: 1. *indicates significance at the 10% level.
2. ** indicates significance at the 5% level.
3. ***indicates significance at the 1% level.

VI. Robustness Test

The method that controls the numbers of control variables is performed to test model robustness. The results in [Table 9] show that fixed assets ratio, fixed assets turnover and growth rate of fixed assets have significant relationships with Tobin's q and the effect is stable among three models. Implying the results of two-way fixed effects is believable.

Table 9. Robustness Test

Tobinq	Model4		Model5		Model6	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef	Std. Err.
fassetratio	-2.175423***	0.6546424	-2.175332***	0.654488	-2.184509***	0.6607399
fassetturnover	0.0000112***	0.0000024	0.0000112***	0.0000024	0.0000112***	0.00000241
fassetrise	0.0016718*	0.0009223	0.0016718*	0.0009222	0.0016699*	0.0009195
debttoassetratio	0.0826801	0.8565871	0.0826651	0.8565281	0.0808096	0.8577394
time2	0.456525***	0.0749769	0.4565348***	0.0749871	0.456473***	0.0749727
time3	-0.572420***	0.1500875	-0.572467***	0.150016	-0.576347***	0.1480534
time4	-0.2001158	0.3099175	-0.2001035	0.3099143	-0.2064542	0.3066597
time5	0.2549577	0.3605742	0.2549956	0.3606011	0.2452798	0.3553963
time6	0.9469375*	0.5033796	0.9469455*	0.5033622	0.9358855*	0.4974344
time7	2.724261***	0.6399559	2.724277***	0.6399379	2.711559***	0.6332548
Inglc	---	---	---	---	---	---
lev	-0.0000635	0.0003795	---	---	---	---
totalassetrise	0.0078718	0.009991	0.0078722	0.009991	---	---
Intotalasset	-2.043565***	0.5789285	-2.043613***	0.5789494	-2.033074***	0.5734398
_cons	46.46	12.3948	46.46477	12.39513	46.24838	12.28399

VII. Empirical Findings

The results present that fixed assets have essential influences on Tobin's q. In terms of results in two-way fixed effects model, fixed assets ratio has a significant negative relationship with Tobin's q at 5% level. This result rejects hypothesis 1: The ratio of fixed assets has a significant influence on the corporate performance, and explains that the larger the scale of fixed assets is, the poorer the corporate performance is. The reasons could be as follows: With the rapid development of Chinese economy, enterprises invested more and more, especially in fixed assets, so the proportion of fixed assets in enterprises has also increased. Due to the slow realization and turnover speed of fixed assets, if the current proportion of fixed assets of enterprises is too high, then the overall liquidity will inevitably be poor. Once capital turnover is not effective, fixed asset investment funds cannot be recovered, which will inevitably lead to high financial pressure, and the insolvency of the corporate assets directly will affect the survival

of the company.

The fixed assets turnover in this study, has a positive effect on Tobin's q in model1 and model2, but the significance level is not stable. But it is not significant in two-way fixed effects. That might be because the correlation between fixed assets turnover and Tobin's q is weak. Therefore, hypothesis 2 is invalid in this study.

Hypothesis 3 is accepted in this study. Growth rate of fixed assets investment has a significant positive relationship with Tobin's q in all the models. The growth rate of fixed assets refers to the ratio of the annual net increase in fixed assets to the original total fixed assets, which reflects the scale and speed of the growth of fixed assets. So when analysis this indicator, we should focus on the reasons for the growth of fixed assets and whether it is economically reasonable. We noticed that in the past 20 years, In China's real estate market, the investment activities have been active, which has had a profound impact on Chinese economy. We also noticed that in the past 20 years, In China's real estate market, the investment activities have been active, which has had a profound impact on Chinese economy. Since the 1990s, the central

government has successively introduced a series of policies and regulations such as the reform of the land use system, the commercialization of housing, and the reform of the housing distribution system, which have stimulated the development of China's real estate, leading to a rapid increase in housing prices. The excess profits obtained from real estate have attracted more and more companies to invest in real estate, and manufacturing companies are no exception. Due to the continuous increase in housing prices, real estate development investment has also increased between 2000 and 2015. In 2010, the investment in real estate development was only RMB 482.594 billion. But it reached 95978.85 billion yuan in 2015, with an increase of nearly 400 billion yuan. Over the same period, the average house price in China has also risen from 4,725 yuan per square meter in 2010 to 6,573 yuan per square meter in 2015. (all data from the National Bureau of Statistics). Generally speaking, fixed assets include buildings, land, machinery, transportation and other assets related to production and operation. According to statistics from the National Bureau of Statistics of China, since 2005, nearly 70% of the fixed assets of listed manufacturing companies are real estate (data from the National Bureau of Statistics), so we can speculate that the reason why fixed asset growth rates has a positive impact on corporate performance is excess profits obtained from real estate.

As for the control variables, debt-to-asset ratio, management shareholding ratio and total asset growth rate all have a positive effect on Tobin q. For most enterprises with debts, corporate income tax is a relatively heavy expenditure, but the interest cost of debts can

be deducted before tax, which is equivalent to an amount of income for the enterprise. And this increase in value will increase as the proportion of debt increases, thereby increasing the company's market value. In a listed company, the major shareholders are often the founders of the company, so they have motivation to manage and supervise the operation of the company. In the complicating external market environment, if the equity is too dispersed, it often hinders companies from being unable to face the rapid changes in the competitive market.

VIII. Conclusions and Prospects

1. Conclusions

The aim of the research is to analyze the fixed estate's influences on corporate performance. Tobin's q is selected to represent corporate performance. The major results are summarized as follows: 1) the scale of fixed assets has a negative effect on corporate performance. 2) the quality of fixed assets has a weak positive relationship with fixed assets. In other words, high quality of fixed estate relatively reduces the cost of operation and increase corporate performance; 3) the growth rate of fixed assets impacts corporate performance positively.

As to the way to increase the performance of companies, managers should focus on optimizing the structure of existing real estate assets and improve efficiency of real estate. It is essential to be vigilant on whether the real estate ratio is overlarge compared to other assets in company's assets structure.

2. Prospects

In this article, there are some insufficiencies in two aspects: First, this article only conducts descriptive statistical analysis and regression analysis on listed companies in the manufacturing industry, and the range of data selection is not comprehensive enough. Therefore, the research conclusions have certain limitations. Second, the empirical research in this article is limited to the impact of the fixed assets of listed manufacturing companies on corporate performance, and has not conducted in-depth research on the influencing factors of capital structure. Therefore we hope to make appropriate extensions in the follow-up study to further modify and improve the research in this article.

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