

Cost Stickiness, Ownership Concentration and Fixed Assets Investment

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Abstract. Investment in fixed assets requires a large amount of capital cost. If investment fails, there will be huge losses. Therefore, it is necessary to consider the Cost Stickiness when investing in fixed assets. This paper takes the fixed assets as the dependent variable and takes the Cost Stickiness as the independent variable. Carrying out an empirical study, the paper discusses the influence of the Cost Stickiness on the investment decision of the fixed assets. At the same time, it also studies the regulation effect of the ownership concentration on the relationship between Cost Stickiness and fixed assets investment. The results show that cost stickiness has negative effects on fixed assets investment, and ownership concentration positively regulates the relationship between Cost Stickiness and fixed assets investment.

Introduction

The cost adjustment, the manager's optimistic expectation and the agency problem will lead to the cost stickiness, that is, when the sales revenue falls, the management still maintains some of the idle resources, and when the sales revenue rises, the management must increase the effective resources to meet the increase of sales revenue. Cost Stickiness has become a topic of great concern in the process of making investment decisions for enterprises. Internal investment is mainly for fixed assets. Due to the characteristics of fixed assets, the investment needs large amount of capital consumption and high cost. The efficiency of investment and whether it is worth investing should take into account the issue of cost stickiness.

Literature Review

Overseas literature review. The study of Cost Stickiness abroad begins with ABJ[1]. Cost Stickiness is the phenomenon when the increase rate of cost is higher than the decrease rate in the volume of business (Anderson et al., 2003).

Doonan[2] studied 20 countries, including developed and developing countries, and found that 19 of them have sticky operating costs, which proves that the cost stickiness is a global and universal phenomenon.

Banker and Chen[3] took Cost Stickiness into account when they analyzed earnings prediction analysis and found that the accuracy of the earnings forecast model considering the Cost Stickiness was higher.

Weiss[4] developed a model for measuring stickiness directly, and examined the relationship between Cost Stickiness and the accuracy of earnings forecasts. The results show that the Cost Stickiness has a significant negative impact on the accuracy of earnings forecast, and investors should fully recognize the impact of Cost Stickiness on earnings forecast.

Domestic literature review. The first two scholars in China to pay attention to cost are Zhelu Sun and Hong Hong[5]. They divided the reason of the formation of the Cost Stickiness into three kinds, contract theory, efficiency theory and opportunism theory.

Youmei Che[6] and Shangkun Liang[7] found that management can affect Cost Stickiness. Jiang Wei[8] noticed that financial environment may influence Cost Stickiness. Yuanyuan Liu[9] held the opinion that Labor Contract Law can affect the Cost Stickiness. Xiaoxiao Wang[10] found that fixed assets investment may affect enterprise performance to a certain extent.

In the related research of cost stickiness, two scholars of Huaxia Hu and Hong Hong[11] studied

the impact of Cost Stickiness on R & D investment in 2017. The relationship between Cost Stickiness and R & D innovation investment was tested by the sample of A stock companies from 2010-2015 in China. The results show that the Cost Stickiness has a positive impact on the investment of R & D innovation, and the ownership structure and managers' characteristics have a moderating effect on the relationship.

Comment. Most of the current literature is to study the existence and influence factors of cost stickiness, and seldom study the analysis of Cost Stickiness on investment (especially fixed assets investment), and cannot connect the change of cost stickiness with the internal investment expansion of the enterprise, and cannot use the Cost Stickiness on the basis of the existing theoretical and empirical results. Therefore, this paper studies the relationship between Cost Stickiness and internal investment. The internal investment is mainly fixed assets investment. This paper thus studies the influence of Cost Stickiness on the investment decision of fixed assets, in order to expand the use of cost stickiness, make the investment more reasonable and efficient for the fixed assets, and bring more benefits for the enterprises.

Empirical Design

Hypothesis. Cost management is an important aspect of enterprise's daily operation. The cost of profit making is the result of business decision. Good cost management helps enterprises to accurately locate assets and maximize profits with the least cost. Cost is composed of fixed cost and variable cost. Traditional cost theory regards cost as a linear function with business volume. However, in recent years, scholars have found that when the amount of increased business and the reduced business is equal, the change of the total cost is unsymmetrical, so the concept of cost stickiness is put forward. Because of the existence of cost stickiness, the traditional cost theory will reduce the efficiency of decision making when adjusting economic resources and making investment decisions. Therefore, it is particularly important to introduce Cost Stickiness in the analysis of investment cost.

Because of the asymmetry between the cost and the sales revenue, when the sales revenue increases by 1%, the sales cost increases more, when the sales revenue decreases by 1%, the corresponding cost reduced less. The existence of this cost stickiness makes the enterprise take the cost change into account while increasing the internal investment to expanding the scale of the enterprise. Domestic investment of enterprises is focused on the fixed assets, so this paper mainly studies the impact of Cost Stickiness on the investment of fixed assets. The new classical investment theory, which was developed in 1960s, believes that the enterprise will maintain its asset scale to meet the needs of production under the established technical level and a certain proportion of cost and income. At the same time, raising investment level may not result in higher yield growth rate. It is not just the increase of investment but the increase of production efficiency that matters. To ensure the improvement of production efficiency, we must introduce Cost Stickiness as reference while considering the expansion of investment scale. Cost Stickiness will make enterprises keep prudent when investing, and will not blindly invest in fixed assets. Therefore, this article puts forward the following assumptions:

H1: Cost Stickiness has negative effect on fixed assets investment.

The ownership structure determines the concentration of a company's equity and the position of the large shareholder in the company, which determines the efficiency of the allocation of ownership, and will ultimately affect the company's decision-making. When the ownership of the company is too concentrated, the controlling shareholder should deal with the resource allocation problem caused by the change of business volume through the investment expansion or the transfer of surplus resources. The reduction of ownership concentration is conducive to the mitigation of cost stickiness. The reduction of ownership concentration is conducive to the mitigation of cost stickiness. Collective decision making can effectively avoid arbitrary judgment in individual decision making. Therefore, this article puts forward the following assumptions:

H2: Ownership concentration positively regulates the relationship between Cost Stickiness and

fixed asset investment.

Data. In this paper, the manufacturing companies of A shares in Shenzhen and Shanghai stock markets from 2013 to 2016 in Hubei are selected as research samples. 153 observation samples were finally obtained after eliminating ST companies and data missing companies. The data are from the CSMAR database.

Variable and definition. The Interpreted variable is the ratio of fixed assets (FA). Fixed assets ratio is the ratio of fixed assets to total assets, which indicates the company's investment in fixed assets.

The explanatory variables are Cost Stickiness. Cost sticky phenomenon was first discovered by ABJ through empirical research. After the design of the ABJ model, it has been widely recognized and applied by scholars. The existing researches on Cost Stickiness are mostly carried out through ABJ model. However, ABJ model can only measure the stickiness of industry or nation by regression of large samples. It is an indirect estimation model, and it cannot directly estimate the Cost Stickiness level of a certain enterprise. To compensate for the shortcomings of ABJ model, Weiss (2010) designed a WEISS model, which can directly estimate the stickiness of enterprises. This paper studies the impact of Cost Stickiness on enterprise's long and short term performance. It needs to use the Cost Stickiness of the enterprise as an independent variable. Therefore, this paper uses the WEISS model to calculate the stickiness level of a single enterprise for a certain year. The calculation formula is as follows:

$$Sticky_{i,t} = \ln\left(\frac{\Delta cost}{\Delta sale}\right)_{i,a} - \ln\left(\frac{\Delta cost}{\Delta sale}\right)_{i,b} \quad a, b \in \{t, t-3\} \quad (1)$$

Sticky is Cost Stickiness, a is the quarter of rising sales, and b is the quarter of decline sales, i refers to company, $\Delta cost_{i,t} = cost_{i,t} - cost_{i,t-1}$, $\Delta sale_{i,t} = sale_{i,t} - sale_{i,t-1}$. $\Delta cost$ and $\Delta sale$ respectively represent the change of cost and income of i company in a quarter, sale refers to operation revenue, cost refers to total cost. When Sticky is positive, it means there is cost stickiness, the greater the value, the higher the cost sticky level. This paper selects the ownership concentration (Top), the ratio of shareholders' equity to fixed assets (RSEFA), the liquidity ratio (Liquid) and the asset liability ratio (Lev) as the control variables. The definition of each variable is shown in Table 1.

Table 1 Definition

Variable symbol	Variable name	definition
FA	ratio of fixed assets	fixed assets / total assets
Sticky	Cost Stickiness	as calculation formula (1)
Top	ownership concentration	proportion of the first largest shareholder
RSEFA	ratio of shareholders' equity to fixed assets	fixed assets / total stockholders' equity
Liquid	liquidity ratio	current assets /current liabilities
Lev	asset liability ratio	liabilities / total assets

Model. Based on the theoretical analysis of cost sticky and fixed assets investment, in order to test hypothesis 1 and hypothesis 2, the model 2 and model 3 are constructed as follows.

$$FA = \beta_0 + \beta_1 Sticky + \beta_2 RSEFA + \beta_3 Liquid + \beta_4 Lev + \varepsilon_1 \quad (2)$$

$$FA = \alpha_0 + \alpha_1 Sticky + \alpha_2 Top + \alpha_3 Sticky * Top + \alpha_4 RSEFA + \alpha_5 Liquid + \alpha_6 Lev + \varepsilon_2 \quad (3)$$

Statistical Analyses

Description. Descriptive statistics for each independent variable and dependent variable are shown in Table 2. It can be seen from table 2 that the minimum value of the fixed assets ratio is 0.022, the maximum value is 0.583, the standard deviation is 0.17, which indicate that the distribution of fixed assets is more uniform and the difference is not big. The minimum value of cost stickiness is -13.931, the maximum value is 1.539, the standard deviation is 1.963, the median is 0.004, which indicate that the enterprises generally have the Cost Stickiness, but the Cost Stickiness varies between the enterprises.

Table 2 Description

Variable	N	Mean	Standard Deviation	Median	Minimum	Maximum
FA	153	0.257	0.17	0.214	0.583	0.022
Sticky	153	-0.478	1.963	0.004	1.539	-13.931
Top	153	0.944	0.061	0.969	1.005	0.769
RSEFA	153	4.506	5.787	2.825	31.353	0.287
Liquid	153	2.336	2.419	1.571	17.586	0.368
Lev	153	0.369	0.187	0.343	0.766	0.025

Result. The regression results are shown in Table 3. From the model 2 of Table 3, it can be seen that the Cost Stickiness and the fixed asset ratio are negatively correlated on the significant level of 10%, indicating that the Cost Stickiness has a negative effect on the investment of fixed assets, which is consistent with hypothesis 1. From model 3, it can be seen that the coefficient of Sticky* Top is significantly positive at the level of 10%, indicating that the ownership concentration has a positive regulating effect on the relationship between Cost Stickiness and fixed asset investment, thus proving the hypothesis 2.

Table 3 Empirical Results

Variable	Model_2	Model_3
Sticky	-0.196** (0.101)	-4.905* (3.03)
Top		-6.36 (3.659)
Sticky* Top		4.933** (3.155)
RSEFA	0.192*** (0.043)	0.205*** (0.044)
Liquid	0.119 (0.095)	0.085 (0.098)
Lev	-0.368** (0.146)	-0.284** (0.156)
F	6.008***	4.956***
adjR ²	0.196	0.187
N	153	153

Conclusion

Through the study of Cost Stickiness and fixed asset investment, this paper finds that: (1) the Cost Stickiness has a negative effect on the fixed assets investment, the greater the cost stickiness, the less the internal investment, (2) the ownership concentration is positively regulating the relationship

between the Cost Stickiness and the fixed assets investment.

Because of the cost stickiness, enterprises will take the increment speed of cost into account when they make internal investment. Fixed assets investment takes a long time, so it is necessary to measure the cost sticky problem first when making investment decision. If the cost growth is too fast and the income growth is slow, that is, the cost stickiness is high, we must invest prudently, otherwise it will bring great losses to the enterprise. On the issue of equity distribution, the more concentrated stock ownership is, the more obvious the cost sticky effect is. When the ownership is scattered, the investment decision needs more shareholders to participate, so that they can make a more rational decision, and improve the investment efficiency.

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