An Empirical Study on the Impact of Internal Control on Cost Stickiness

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Abstract—Internal control is a powerful guarantee for the integrity and reliability of corporate property and accounting information, and it is also a mean for enterprises to improve operating cost management. We use the data from 2015 to 2019 (Chinese listed enterprises) to establish a multiple regression model to analyze the impact of internal control quality on cost stickiness. The research results show the enterprises that find defects in internal control and propose positive measures to correct them can reduce the cost stickiness.This article uses the method of data regression analysis by computer software(SAS) and analyzes financial information with data thinking to realize financial digital transformation. This study deepens the impact of internal control on cost stickiness.

Keywords:cost stickiness; internal control; empirical study

1 Introduction

Cost management is one of the important components of enterprise management. In the actual business operation, cost stickiness actually reflects the financial situation of the company. According to the traditional cost theory, the change of cost is proportional to the business volume of the company. However, in recent years, empirical studies have proved that the cost is sticky. In other words, the cost is not proportional to the volume of business.

With the advent of the era of big data and intelligence, the digital reform of enterprises has become an inevitable trend of social and economic development, which will have a positive impact on various management tasks of enterprises. Through digital transformation, Enterprises as micro-individuals need to realize the innovation of enterprise management theory and method system. At present, digital technology can basically be fully embedded in various production and business circulation links of enterprises, making traditional financial data into important reference indicators for enterprise production and operation management, improving financial management capabilities, and enhancing the core competitiveness of enterprises.

This studies the influence of internal control on cost stickiness, enriches the theoretical research on the relationship between internal control and cost control, and through the analysis of financial data of listed companies, make relevant enterprises realize the importance of internal control in enterprise cost management and reduce cost stickiness.

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2 LITERATURE AND HYPOTHESIS

Hammersle [1], Cassell et al [2] and Dan Dhaliwal et al. [3] found that Good internal control can reduce operating costs, and enterprises with deficient internal control will lead to increased costs. Brüggen A et al. [4] found relationship about executive compensation and the cost stickiness, that is, when payment of executive compensation is linked to earnings per share, the executives will pursue the long-term interests of the company, and the company will show stronger cost stickiness. Mohammadi A et al. [5] found relationship about organizational capital, human capital and cost stickiness. Organizational capital and human capital represent the efficiency of the company's internal resource integration. The research results show that the better the organization cost and human capital of a company, (that is the higher the efficiency of internal resource integration) the lower the cost and expense stickiness of the company.

MU ZHANG & LIU [6] studied the relationship about managerial behavior, corporate governance, and cost stickiness. The expansional motivation of management enhances the cost stickiness of enterprises, and this relationship is manifested in enterprises with relatively concentrated capital. Perfecting the corporate governance mechanism of the enterprise can effectively curb the self-interested behavior and expansion intention of the management, and reduce the cost stickiness of the enterprise. Wang et al. [7] studied the relationship about overconfidence of management and cost stickiness. overconfidence of management will increase the cost stickiness of enterprises.

A sound governance structure and a sound organizational structure can establish a sound risk identification, evaluation system, supervision and control mechanism. In terms of the main factors leading to the cost stickiness, the decision-making deviation of resource allocation by enterprise decision-making tiers when revenue is reduced is the fundamental cause of adjustment costs. Internal supervision is a kind of internal institutional arrangement, including incentive system and supervision system. It can not only prevent the management slack of enterprise managers and blind optimism caused by excessive arrogance, but also prevent enterprise managers from abusing resources and power to expand the enterprise scale. In summary, we find other factors can effect the cost stickiness of companies in China. Therefore, we think nice internal control can effectively play its role, that is, when companies find defects in internal control and put forward active measures to correct them, they can reduce their cost stickiness. Accordingly, we propose the following by.

Hypothesis I: Chinese listed companies still have cost stickiness.

Hypothesis II: Companies that find defects in internal control and propose positive measures to correct them can reduce their cost stickiness.

3 MODEL, DATA, AND STATISTICS

3.1 Model Design and Implementation

3.1.1 Regression analysis process design

According to our research direction, we use the linear regression algorithm to write in SAS language to realize the analysis of the company's accounting information and draw our hypothetical conclusions. The main functions and processes are shown in Figure 1.

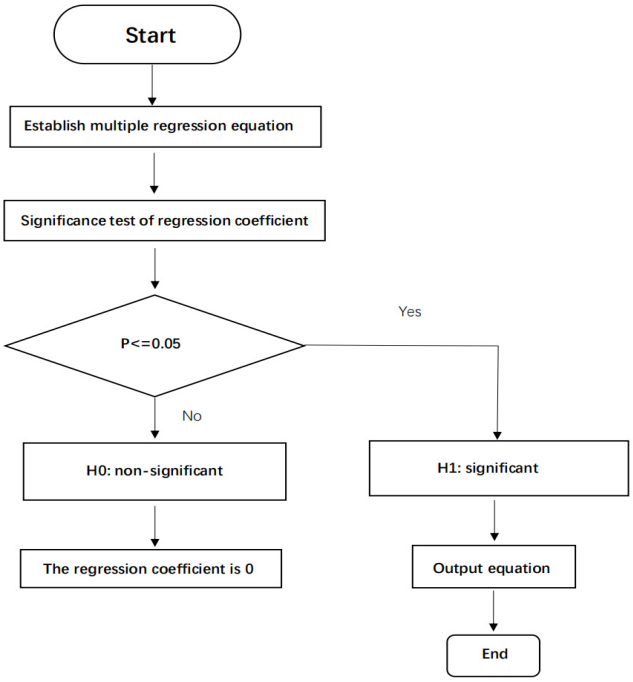

Fig1: Flow chart

3.1.2 Program code

The research main SAS code below:

```
Proc import datafile= ’ External data location’  out= ‘SAS Data Set’ ;
run;
Proc reg data=’ Data Set’ ;
Model ‘ dependent variable ’ = ’ independent variable A ’ ‘dependent variable B’ ‘dependent variable C’ ...;
run;
```

3.2 MODEL

We set model 1 in order to test listed enterprises has stickiness or not, as Anderson (2003) model. We set model 2 in order to test whether hypothesis II is true or not.

$$\Delta COST_{i,t} = \beta_0 + \beta_1 \times \Delta S_{i,t} + \beta_2 \times \Delta S_{i,t} \times D_{i,t} + \text{All interaction terms}_{i,t} + \beta c \times \text{Controls}_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\Delta COST_{i,t} = \beta_0 + \beta_1 \times \Delta S_{i,t} + \beta_2 \times \Delta S_{i,t} \times D_{i,t} + \beta_3 \times \Delta S_{i,t} \times D_{i,t} \times IC_{i,t} + \text{All interaction terms} + \beta c \times \text{Controls}_{i,t} + \varepsilon_{i,t} \quad (2)$$

Table 1 explains the variables in the model. As Anderson et al. [8], Chen et al. [9], and Yang [10], we use control factors SIZE, FCF and INT affect the cost stickiness.

Table 1. Definition of Model Variables

ΔCOST	ln[1] costs(SG&A/lagged SG&A) i for Company t for year
ΔS	ln[1] (sales/lagged sales) i for Company t for year
D	Dummy variable is one (sales in year t < one in year t-1), 0 otherwise
IC	Dummy variable is one if enterprise managers find defects in internal control and propose positive measures to correct them, and zero otherwise.
SIZE	ln[1] assets value i for Company t for year
INT	ln[1] assets value /by sales i for Company t for year
CFO	ln[1] operating cash flows/assets value i for Company t for year

Here we know β1 shows cost to increase in operation revenue, we can see operation revenue increased 1%, and the cost increased β1%. When variable Di,t takes 1 operation revenue decreases, β1+β2 show the cost to decrease of operation revenue, we can see operation revenue decreases by 1% and cost decreases by (β1+β2)%. If the traditional theory effective, it means cost increase or decrease in proportion to the increase or decrease, that is β2=0 and β1=1. However, if cost stickiness exist, the coefficients β1>β1+β2 that means β2<0, and β2 need have statistical significance, so smaller β2 we have and the greater cost stickiness we get. The ICi,t is Dummy variable(equals 1 the companies that find defects in internal control and propose positive measures to correct them 0 otherwise), β1+β2+β3 verify the hypothesis, β3 can show the degree of influence of internal control factors on stickiness.

3.3 Data

The data is downloaded from CSMAR database from 2015 to 2019. After we clean the default value, we get final sample (5866).

3.4 Descriptive Statistics

From Table 2. the median and mean of ΔCOST equal to 0.09 and 0.11. The mean and median of ΔS is 0.30 and 0.23. The distributions of main variables are basically symmetrical and concentrated. Mean of IC equal to 0.35, it means 35% companies from data have the situation

1 Natural logarithm

of hypothesis II. Fig 2 shows the variables we used are all approximately normal distribution. we also can see the description of the relationship between variables.

Table 2. Descriptive Statistics

	N	*Mean*	SD	*Min*	*Median*	*Max*
ΔCOST	5866	0.11	0.32	-1.81	0.09	4.77
ΔS	5866	0.30	1.07	-6.74	0.23	7.34
D	5866	0.35	0.48	0.00	0.00	1.00
IC	5866	0.35	0.48	0.00	0.00	1.00
SIZE	5866	22.45	1.34	18.20	22.27	28.51
INT	5866	2.84	0.92	0.13	2.68	10.35
CFO	5866	-3.50	1.32	-11.94	-3.36	0.77

Note: N is the size of sample

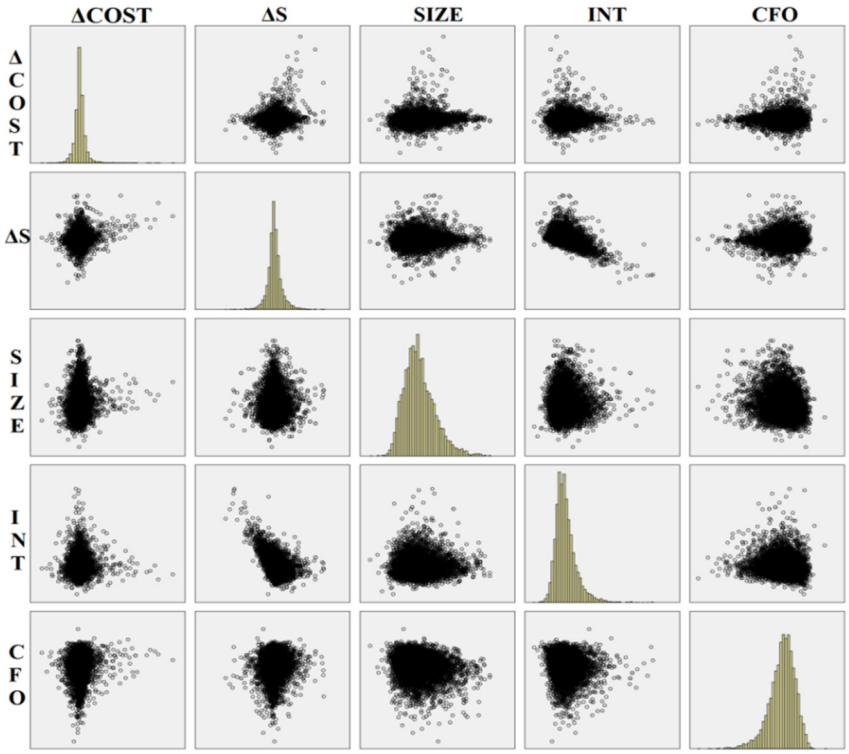

Fig. 2. SPLOM of variables

4 Results and analysis

We see Table 3 shows the coefficients of model 1, β_1=0.071, β_2= -0.030 and $\beta_1+\beta_2$ is 0.041. Revenue increases 1%, we find cost increases 0.071%. When prime operating revenue reduced 1%, the cost only decrease 0.041%, 0.030% is not obtained. The stickiness is 0.030%. We see cost stickiness exist. Hypothesis I is tenable.

Table 3. Impact of Cost stickiness

	Estimate	**T test**
Intercept	-0.295	-4.19
ΔS	0.071***	13.02
Δ*Si,t* × *Di,t*	-0.030**	-2.29
SIZE	0.016***	5.29
INT	0.029***	4.78
CFO	0.022***	6.91
R²	0.048	

Table 4. Impact of Internal Control factor

	Estimate	**T test**
Intercept	-0.317	-3.84
ΔS	0.071***	16.34
Δ*Si,t* × *Di,t*	-0.045***	-3.59
Δ*Si,t* × *Di,t* ×IC*i,t*	0.030**	-3.44
SIZE	0.018***	5.81
INT	0.029***	4.80
CFO	0.022***	8.82
R²	0.049	

Note: *, **, and *** indicate significance at the 10%, 5%, and 1% levels.

We see Table 4 shows the coefficients of model 2. β_1=0.071, β_2= -0.045, and β_3=0.030. β_3> 0, indicating that internal control factors have an inhibitory effect on cost stickiness. Verify hypothesis II.

As statistical view, the companies that find defects in internal control and propose positive measures to correct them can reduce the cost stickiness.

5 Conclusion

According to the research we get the conclusion that companies in stock market still have cost stickiness. Companies that find defects in internal control and propose positive measures to correct them can reduce corporate cost stickiness.

As for other factors that cause cost stickiness, there is still room for further improvement, research and discussion.

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