

Research on the Influence of Internal Control Quality on Enterprise Performance

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Abstract

If an enterprise wants to enhance its sustainable competitiveness and achieve the growth of its performance, high-quality internal control is essential. This paper takes the relevant data of China's Shanghai and Shenzhen A-share listed enterprises from 2010 to 2019 as a sample to deeply explore the correlation between internal control and enterprise performance, and draws the following conclusions: the improvement of internal control quality can obviously promote the increase of enterprise performance level, and the improvement of enterprise internal control construction is conducive to achieving better business performance and promoting enterprise performance growth.

Keywords

Internal Control; Enterprise Performance; Empirical Analysis.

1. Introduction

Internal control plays an important role in the production and operation of enterprises and is an important link to prevent enterprise risks. Since the basic norms for internal control of enterprises and the supporting guidelines for internal control of enterprises issued by China at the beginning of 2012, the listed companies on the Shanghai and Shenzhen main boards have been required to implement the construction of internal control, and then many relevant documents on strengthening the disclosure of internal control information of listed companies have been issued. It can be seen that China attaches great importance to the disclosure of internal control information of listed companies. The starting point of strengthening the internal control of enterprises is to improve the ability of enterprises to prevent risks, and then realize the business objectives of enterprises. Then whether the improvement of internal control quality can directly promote the improvement of enterprise performance is also the purpose and significance of this paper.

2. Literature Theory Review and Problem Hypothesis

Based on the principal-agent theory, there are more or less asymmetric information problems between the managers and the owners of enterprises. The internal production and operation process of enterprises needs to be controlled by good internal control. Good internal control mechanism makes the transmission of decision-making information smoother, and supervises and prevents the self-interest and fraud of the management to maximize their own interests, Improve the quality and efficiency of the management's business strategy, promote the enterprise to optimize the production process, accelerate the research and development of new products, and enhance the market competitiveness and risk resistance. At the same time, when the enterprise carries out effective internal control management, it clarifies the rules and regulations to be observed and the post responsibilities to be undertaken by the employees. While improving the efficiency of employees in using various resources of the enterprise, it can also reduce work errors, ensure the safety of the production and operation process, reduce the probability of business risks, and achieve the growth of enterprise performance.

From the perspective of signal transmission theory, an effective internal control mechanism can reduce accounting errors in finance, ensure the quality of accounting information and prevent internal financial risks. For example, Oliver (1991) [1] thinks that internal control is an important part of the enterprise organization system, which will affect the competitiveness of enterprises through various ways, and then affect the performance of enterprises.

The research of J. Altamuro (2006) [2] shows that the management of a company with high quality of internal control is restricted by the internal control mechanism. When making investment decisions on risk projects, they will be more cautious and make reasonable investment decisions in combination with the company's ability to bear investment risks to ensure the company's operating efficiency. Z.X. Zhang (2007) [3] found that there is a significant positive correlation between the internal control quality of enterprises and their own performance. Companies with high information disclosure quality have better financial performance and market performance. Ashbaugh (2009) [4] found that the quality of internal control positively promotes the business ability of enterprise operators, and the improvement of enterprise operators' ability has a positive impact on enterprise performance. M. Li and W. Zong (2014) [5] quantified the five elements of internal control, including the control environment, and carried out empirical tests on the impact of the five elements of internal control on the operating performance of listed enterprises, and concluded that the quality of internal control can indeed positively promote their operating performance. The high-quality internal control signals transmitted by the enterprise will make investors understand that the internal control activities of the enterprise have played a positive role in its operation. External investors can make investment decisions decisively according to the good internal control quality signals of the enterprise, improve investment efficiency, reduce the risk compensation premium of external investors, reduce the external financing cost of the enterprise, and improve enterprise performance.

This paper proposes a hypothesis: the quality of internal control has an obvious promoting effect on enterprise performance.

3. Principal Component Analysis to Construct Comprehensive Evaluation Index of Enterprise Performance

Table 1. Indicators and definitions

Level 1 Indicators	Level 2 Indicators	Index Definition
debt paying ability	Current Ratio (X1)	Current assets / current liabilities
	Cash Ratio (X2)	Cash and cash equivalents ending balance / current liabilities
operation capacity	Total Assets Turnover Rate (X3)	Operating income / total assets ending balance
	Turnover Rate of Current Assets (X4)	Net income from main business / average total current assets
profitability	Return on Assets (X5)	(Total profit + financial expenses) / total assets
	Operating Net Profit Rate (X6)	Net profit / operating income
Development ability	Net Profit Growth Rate (X7)	(Net profit amount of the current quarter-net profit amount of previous quarter) / (Net profit amount of previous quarter)
	Total Profit Growth Rate (X8)	(Total profit amount of the current year-Amount of the previous quarter of the total profit) / (Total profit amount of the previous quarter)

Principal component analysis can extract representative components with high information content when the number of selected financial indicators is large, and conduct dimension reduction analysis on many indicators, so as to make the financial data clearer. In order to comprehensively and accurately reflect the comprehensive performance of the enterprise's operation, this paper selects indicators that can reflect the enterprise's solvency, profitability, operating capacity and development capacity. The selected indicators are shown in Table 1.

3.1. Principal Component Analysis Feasibility Test

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Determinant of the correlation matrix
Det = 0.017

Bartlett test of sphericity
Chi-square = 46723.943
Degrees of freedom = 28
p-value = 0.000
H0: variables are not intercorrelated

Kaiser-Meyer-Olkin Measure of Sampling Adequacy
KMO = 0.541
    
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Figure 1. Bartlett and KMO test

The initial step of principal component analysis is to observe whether the data is suitable for principal component analysis through Bartlett and KMO tests. As can be seen from Figure 1 above, the KMO value is 0.541, greater than 0.5, and the p value of Bartlett sphericity test is less than 0.05. Therefore, the sample data is suitable for principal component analysis.

3.2. Principal Component Analysis and Principal Component Extraction

Table 2. Total variance results

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	2.5315	0.44725	0.3164	0.3164
Factor2	2.08426	0.667	0.2605	0.577
Factor3	1.41726	0.28399	0.1772	0.7541
Factor4	1.13326	0.85265	0.1417	0.8958
Factor5	0.28062	0.08448	0.0351	0.9309
Factor6	0.19614	0.00727	0.0245	0.9554
Factor7	0.18887	0.02077	0.0236	0.979
Factor8	0.16809	-	0.021	1

Table 3. Initial factor load matrix coefficient

Variable	Factor1	Factor2	Factor3	Factor4
X1 (Quick Ratio)	0.1758	-0.30373	0.33078	0.25455
X2 (Cash Ratio)	0.18326	-0.29902	0.32677	0.25309
X3 (Total Asset Turnover Ratio)	-0.05631	0.31568	0.41799	0.21791
X4 (Turnover Rate of Current Assets)	-0.07565	0.34409	0.36537	0.16772
X5 (Return on Assets)	0.2886	0.14415	0.14507	-0.44143
X6 (Operating Net Interest Rate)	0.3062	0.07145	0.11928	-0.45377
X7 (Net Profit Growth Rate)	0.26818	0.16368	-0.26998	0.37672
X8 (Total Profit Growth Rate)	0.26957	0.16554	-0.27023	0.36778

Table 2 shows the total variance results of the interpretation of the original data by the common factors of the principal components extracted from the sample data. The principal components with eigenvalues greater than 1 are screened out, which are 2.5315, 2.08426, 1.41726 and

1.13326 respectively. The interpretation degree of the four principal components to the original data is 89.58%, which exceeds 80%, and has loaded most of the information of the original data. They can comprehensively evaluate the enterprise performance of listed enterprises.

The initial factor load matrix coefficients of the corresponding principal component variables are shown in Table 3. It can be seen that the operating net interest rate in the first principal component has a high asset return rate factor load, which is a comprehensive factor reflecting the profitability of the sample enterprises. The total asset turnover rate of the second principal component and the current asset turnover rate factor are relatively high in load, so the second principal component can be regarded as a comprehensive factor reflecting the solvency of the sample enterprise. The quick ratio and cash ratio with higher load in the third principal component can reflect the solvency of the sample enterprise. In the fourth principal component net profit growth rate and total profit growth rate factor load is high, reflecting the growth ability of the sample enterprise.

Table 4. Factor score matrix

Variable	Factor1	Factor2	Factor3	Factor4
X1	0.1758	-0.30373	0.33078	0.25455
X2	0.18326	-0.29902	0.32677	0.25309
X3	-0.05631	0.31568	0.41799	0.21791
X4	-0.07565	0.34409	0.36537	0.16772
X5	0.2886	0.14415	0.14507	-0.44143
X6	0.3062	0.07145	0.11928	-0.45377
X7	0.26818	0.16368	-0.26998	0.37672
X8	0.26957	0.16554	-0.27023	0.36778

The following factor formulas and comprehensive scores can be obtained from the factor score matrix in the table above:

Principal component 1 (factor1)

$$=0.9467*X1+0.9431*X2+0.0070*X3+-0.1523*X4+0.0777*X5+0.0639*X6+0.0116*X7+0.0101*X8$$

Principal component 2 (factor2)

$$=0.0633 * X1 + 0.0744 * X2 + 0.0128 * X3 + 0.0647 * X4 + 0.9274 * X5 + 0.9448 * X6 + 0.1598 * X7 + 0.1544 * X8$$

Principal component 3 (factor3)

$$=-0.0042 * X1 + 0.0261 * X2 + 0.0066 * X3 + 0.0001 * X4 + 0.1792 * X5 + 0.1341 * X6 + 0.9299 * X7 + 0.9312 * X8$$

Principal component 4 (factor4)

$$=-0.0797 * X1-0.0511 * X2 + 0.9321 * X3 + 0.9127 * X4 + 0.1044 * X5-0.0253 * X6 + 0.0060 * X7 + 0.0006 * X8$$

Comprehensive score: total

$$= (0.3087 * \text{factor1} + 0.2508 * \text{factor2} + 0.1900 * \text{factor3} + 0.1431 * \text{factor4}) / 0.8926.$$

According to this, the comprehensive score of enterprise financial indicators calculated by principal components is taken as the proxy variable of enterprise performance.

4. Linear Regression between Internal Control and Enterprise Performance

4.1. Sample Selection and Data Source

The object of this study is listed companies in Shanghai and Shenzhen stock markets, and the research samples are selected according to the following principles: (1) the companies with ST and Pt during the research period are excluded; (2) Enterprises in financial and insurance industries are excluded; (3) Eliminate the sample enterprises with serious lack of relevant indicator data; (4) Exclude the enterprises newly listed in the IPO in that year. The data in this paper are collected from the internal control and risk management database of DIB, and other data are from CSMAR database.

4.2. Variable Definition and Model Construction

(1) Explained Variable: Enterprise Performance (Total). Some literature uses financial indicators to measure, while others use non-financial indicators to measure. In order to reflect enterprise performance more comprehensively and accurately, this paper selects representative financial indicators from the aspects of enterprise debt repayment, profitability, operation and growth ability, and constructs the enterprise performance comprehensive score (total) as the proxy variable of enterprise performance based on the principal component analysis method. The higher the total score of enterprise performance, the higher the level of enterprise performance.

(2) Explanatory Variable: Internal Control Quality (IC1): the quantitative index of internal control quality is measured by the internal control comprehensive index, and the logarithm is processed. The larger the value, the higher the internal control quality of the enterprise.

Considering the influence of multiple perspectives, the following indicators are used as the control variables in this paper:

(1) Enterprise Size (Size). Large scale enterprises often have more advantages. For example, large-scale enterprises have strong economic strength, obvious advantages in product research and development, win more market shares, obtain more excess profits, and affect enterprise performance. The total assets of the enterprise are measured by natural logarithm. The larger the value, the larger the enterprise scale.

(2) Enterprise Age (Age). Generally speaking, the older the company is, it means that it has certain brand influence and market share in the market. The performance of start-ups is obviously not as good as that of mature enterprises, so they are regarded as control variables.

(3) Growth (Growth). The development potential of different enterprises is different, and the development ability of their enterprise life cycle stage is also different. In this paper, the growth rate of operating income is used as the proxy index of enterprise growth.

(4) Asset Liability Ratio (LEV). Determining a reasonable asset liability structure helps enterprises to use the tax shield effect to save taxes, and is also conducive to the stable operation of enterprises. The asset liability structure of different enterprises varies greatly. Therefore, it is used as a control variable to reduce the impact of the difference in debt situation between different enterprises on Enterprise Performance.

(5) Internal Cash Flow (CF). If the internal cash flow of an enterprise exceeds a reasonable level, the management of the enterprise will use excess funds to make excessive investment and inefficient operation, which will affect the quality of internal control and the performance of the enterprise.

(6) Tobin Q Value (Q). Tobin Q value is generally used to reflect enterprise value. Companies with high enterprise value generally have better performance, so it needs to be taken as a control variable.

This paper establishes the following model and uses regression analysis to verify whether internal control quality has an impact on Enterprise Performance:

$$\text{Total} = \alpha_0 + \beta_1 \text{total} + \beta_2 \text{SIZE} + \beta_3 \text{AGE} + \beta_4 \text{Lev} + \beta_5 \text{Q} + \beta_6 \text{GROWTH} + \beta_7 \text{industry} + \beta_8 \text{year} + \epsilon_i$$

Where α_0 is the intercept term, Total is the proxy variable of enterprise performance, Size is the size of the enterprise, Age represents the age of the enterprise, Q represents the Tobin Q value of the enterprise, Growth refers to the growth rate of operating income, Industry refers to the industry, and Year refers to the year, ϵ_i is a random disturbance term.

Table 5. Variables

Type of Variable	Variable Name	Variable Symbol	Variable Declaration
explained variable	Enterprise performance	total	Principal component construction
explanatory variable	Internal control quality	IC1	The ln (Dibo Internal Control Integrated Index + 1)
controlled variable	scale	SIZE	The ln (Total assets)
	enterprise age	AGE	(Year of observation-Year of enterprise establishment)
	Growth	GROWTH	(Amount of operating income in the current year-amount of operating income in the same period of last year) / (amount of operating income in the same period of last year)
	asset-liability ratio	LEV	(Total liabilities / Total assets)
	Internal cash flow	CF	(Net cash flow from operating activities / total assets)
	Tobin Q value	Q	(Total Market Value A / Assets)
	Industry virtual variables	industry	According to the 2012 CSRC industry classification, control the industry
	Annual virtual variable	year	Control year

5. Empirical Test

5.1. Descriptive Statistics

Table 6. Descriptive statistics

	count	mean	Var	sd	min	max
total	11429	-0.006	0.214	0.463	-1.992	1.446
IC1	11429	6.140	2.086	1.444	0.000	6.711
SIZE	11429	22.441	1.382	1.176	20.128	25.910
AGE	11429	22.645	26.037	5.103	13.000	37.000
Lev	11429	0.486	0.031	0.177	0.117	0.889
CF	11429	0.045	0.004	0.064	-0.143	0.226
Q	11429	1.849	1.058	1.028	0.841	6.748
GROWTH	11429	0.159	0.147	0.383	-0.505	2.445

The enterprise performance proxy index constructed by the principal component shows that there is a large gap between enterprise performance and the development of listed enterprises is unbalanced. The minimum value of internal control quality is 0 and the maximum value is 6.711, with a difference of as much as 6 times, indicating that the internal control quality of

Listed Enterprises is also uneven. Moreover, the minimum value of growth, the proxy indicator of enterprise growth, is -0.505, and the maximum value is 2.445, indicating that there is a great gap in the development space of different enterprises.

5.2. Correlation Analysis

Table 7. Correlation analysis

	total	IC1	size	age	Lev	CF	Q	growth
total	1.000							
IC1	0.233***	1.000						
SIZE	0.064***	0.063***	1.000					
AGE	0.033***	-0.023**	0.094***	1.000				
Lev	-0.100***	-0.149***	0.443***	0.108***	1.000			
CF	0.269***	0.081***	0.053***	-0.006	-0.154***	1.000		
Q	0.035***	-0.020**	-0.435***	-0.005	-0.272***	0.093***	1.000	
GROWTH	0.206***	0.108***	0.039***	-0.029***	-0.003	0.029***	0.030***	1.000

*p < 0.1, **p < 0.05, ***p < 0.01

The above table is the correlation coefficient table for testing the correlation between all variables used in the regression model by Pearson correlation test. It can be preliminarily observed that the internal control quality (IC1) has a significant positive impact on the comprehensive performance index total constructed by the principal component analysis method, which preliminarily reflects that the internal control quality has a certain positive impact on the enterprise performance. At the same time, it can also be seen from the data in the table that the significance level of the correlation coefficient between the explanatory variables and the control variables in the regression model is mostly greater than 5%, and it is preliminarily judged that there is a strong correlation between them. In addition, the correlation coefficient between different variables in the model is small, which verifies that the variable data used in the regression model in this paper does not have the problem of multicollinearity.

5.3. Multicollinearity Judgment

After the Stata regression analysis, the average Vif of each variable, that is, the variance expansion factor, is less than 10, and there is no problem of multicollinearity.

5.4. Empirical Results

Carry out regression analysis based on the relevant data of sample enterprises to test whether the quality of internal control has a significant impact on enterprise performance. In Table 8, the internal control index is taken as the proxy variable of the internal control quality (IC1) to explain the enterprise performance comprehensive score (total) constructed by the principal component. From the regression results in the table above, it can be found that the internal control quality (IC1) and the enterprise performance comprehensive score (total) have a positive correlation at the significance level of 5%, indicating that the improvement of the internal control quality level will indeed promote and improve the enterprise performance, Hypothesis 1 is verified. In addition, it is also found that the regression coefficient between company size and enterprise performance is significantly 0.048 at the significance level of 1%, indicating that the expansion of company size can also improve its enterprise performance to a certain extent; The regression coefficient between the age of the company and the performance of the enterprise is significantly 0.004 at the significance level of 1%, which indicates that the internal management system of the enterprise with a long operating period is more perfect than that of the start-up enterprise, and the perfect internal management system is helpful to

improve the performance of the enterprise; The regression coefficient between internal cash flow and enterprise performance is significantly 1.747 at the significance level of 1%, indicating that the internal cash flow of the enterprise is sufficient, and it is not easy to damage the enterprise performance such as insufficient investment due to lack of funds. Tobin Q value has a significant positive correlation with enterprise performance at the significance level of 1%, and its regression coefficient is 0.019. Tobin Q value is generally used to measure the market performance of enterprises. The higher the market value of enterprises, the better the growth of enterprise performance.

Table 8. Empirical Results

	total
IC1	0.050***
	(18.092)
SIZE	0.048***
	(11.231)
AGE	0.004***
	(4.848)
Lev	-0.239***
	(-9.212)
CF	1.747***
	(27.841)
Q	0.019***
	(4.188)
GROETH	0.196***
	(19.142)
_cons	-1.390***
	(-13.799)
N	11429
adj.R ²	0.230
year	control
industry	control
F	101.324
r ²	0.232

There is a significant positive correlation between the growth rate of operating income and enterprise performance at the significance level of 1%, and the regression coefficient is 0.196, which indicates that the business objective of the enterprise is to maximize profits, and the growth rate of operating income may bring more profits to the enterprise, thus improving its enterprise performance. The regression coefficient between the asset liability ratio and the enterprise performance is significantly -0.239 at the level of 1%, which indicates that an enterprise's high asset liability ratio will affect the available funds required for its business operation. For some projects that can bring positive net cash flow to the enterprise, it is possible to give up investment due to the financing cost and difficulty caused by the excessive asset liability ratio, which will damage the enterprise performance.

5.5. Robustness Test

Table 9. Robustness test

	ROE
IC1	0.023*** (27.722)
SIZE	0.028*** (21.928)
AGE	0.000 (1.515)
Lev	-0.201*** (-25.907)
CF	0.480*** (25.644)
Q	0.013*** (9.707)
GROETH	0.085*** (27.921)
_cons	-0.654*** (-21.736)
<i>N</i>	11429
adj.R ²	0.302
year	control
industry	control
F	146.726
r ²	0.305

In this paper, the method of replacing explained variables is adopted to test the robustness of the regression model, and the traditional financial index return on equity (ROE) is adopted to further test the correlation between internal control quality (IC1) and enterprise performance. The results are shown in the table. It can be seen that the robustness test results are basically consistent with the results of the previous regression analysis, and the internal control quality (IC1) still has a significant positive impact on the improvement of enterprise performance, which confirms the robustness of the conclusion.

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