An empirical study on the relationship between corporate internal control and financial performance of listed companies

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Abstract: The article empirically examines the effect of internal control on corporate financial performance using a panel multiple regression model with a sample of listed A-share companies in Shanghai and Shenzhen from 2013-2021. The results of the study indicate that internal control has a positive impact on the financial performance of enterprises. This study extends the research related to the impact of internal control on corporate financial performance and provides empirical evidence for firms to improve their internal control.

Keywords: Internal control; financial performance; other comprehensive income.

1. Introduction

In recent years, the financial frauds of Luckin coffee, Kangmei Pharmaceuticals, and Soling shares in China have reflected the lack of internal control in some enterprises in China. Internal control is an important internal governance mechanism of enterprises, which plays an important role in preventing and controlling enterprise risks and helps to detect random errors that occur without subjective intentionality among contracting parties within the enterprise in a timely manner (Ashbaugh-Skaife et al., 2008; Doyle et al., 2007).

More reflection and discussion on the authenticity of financial information eventually promoted the promulgation of relevant laws and regulations. The Sarbanes-Oxley Act (SOX) was enacted in the U.S. and the C-SOX Act was introduced in China. C-SOX stipulates that the management report and audit report of the enterprise's internal control should be disclosed at the same time to help the enterprise ensure the reliability of the report. Since then, internal control has been discussed and analyzed as part of the accounting and auditing system, and over time has developed into a more developed and complete system of internal control for enterprises, which has led to the application of this system to the field of economic management.

This paper has the following contributions: First, although there are many discussions and studies on financial performance indicators, most of them focus on the link between social responsibility performance and corporate financial performance, and the few studies that focus solely on corporate financial performance indicators also mostly explore and analyze the internal link between their indicators. This paper discusses within this area，and has certain theoretical significance. Second, internal control is an objective management issue faced by a large number of enterprises in practice, and this paper provides some reference value for such management issues based on the linkage between internal control and financial performance indicators. This paper has practical significance in guiding practical activities by constructing a link between internal control mechanisms and financial performance indicators.

2. Literature Review

（1）Foreign Studies

Foreign literature research on the relationship between internal control and corporate financial performance is mainly reflected in the following areas:

1. The impact of internal control on the efficiency of business operations: COSO (1992, 2013) argues that effective internal control should be able to maintain the effectiveness and efficiency of business operations. Alexander et al. (2013) argue that internal control system can improve the efficiency of company operations and maintain the effectiveness of assets, thus contributing to the efficiency of business operations.

2. The impact of internal control on corporate profits: Cushing (1974) used a mathematical model to improve the credibility of the internal control system, leading to an increase in the overall efficiency of internal control and subsequently to an increase in corporate profits.

3. The impact of internal control on the level of corporate management: Biddle et al. (2009) pointed out that good internal control can improve the decision-making efficiency of managers.

（2）Domestic Research

The domestic research on the impact of internal control and corporate financial performance is roughly divided into two sides, one side believes that internal control has a positive effect on corporate financial performance; while the other side believes that internal control has no significant effect on corporate financial performance. Referring to Biddle et al. (2009), Li Wanfu et al. (2011) tested the relationship between internal control and investment level and concluded that internal control can effectively improve investment efficiency. Zhang Chuan et al. (2009) found that effective implementation of internal control system in real estate industry has a significant effect on improving corporate performance.

Another view is that internal control has no significant effect on financial performance. When Ye Chengang(2016) studied the impact of internal control on corporate performance for firms with different equity nature, the empirical results showed that the impact of internal control on corporate performance showed significant differences depending on the nature of equity, and only among private firms, the quality of internal control had a significant contribution to corporate financial performance; while there was no significant correlation between internal control and corporate performance in state-owned firms.

The literature review shows that although the number of domestic and international studies on the relationship between internal control and financial performance is high, the relationship between the two is not clear.

3. Theoretical Analysis and Research Hypothesis

(1) The Impact of Internal Control on Corporate Financial Performance

Effective internal control can guide the flow and flux of resources such as professional managers, capital market and technology market through platforms such as competition mechanism, decision-making mechanism, incentive and restraint mechanism, value creation and distribution mechanism, supervision mechanism, risk governance mechanism and performance evaluation mechanism to reduce operational risks and boost investors' confidence. Effective internal control can bring into play the governance ability to predict and analyze the business risks faced by enterprises in a timely manner and formulate reasonable risk countermeasures, thus improving the scientific nature of enterprise decision-making. Therefore, we propose the first hypothesis in this paper:

H1: Internal control has a positive effect on the corporate financial performance.

(2) The Moderating Effect of Other Comprehensive Income Reform on Internal Controls Affecting Corporate Financial Performance

In order to converge with international accounting standards, China formally introduced the account of other comprehensive income in the revised Accounting Standards for Business Enterprises No. 30 - List of Financial Statements in 2014, which explicitly requires the presentation of other comprehensive income in the balance sheet, income statement and statement of changes in owners' equity at the same time.

The confusion of articulation relationship is the result of unbalanced presentation of other comprehensive income reform. The articulation relationship refers to the relationship between the relevant figures in the account books and accounting statements, which can be used for mutual inspection and verification. The original presentation articulation relationship is logically strict, and the three statements reflect the strict articulation relationship with the Profit statement as the link. According to the statistical results of CSMAR, with the reform of other comprehensive income, the ratio of listed companies for the presentation of other comprehensive income has slightly increased, but the problem of under-reporting, over-reporting and omission of other comprehensive income still prevails, which is to some extent caused by the disorderly presentation logic, and the disclosed other comprehensive income has certain impact on the original statement.

Due to the requirement to present other comprehensive income in the financial statements, the reform of other comprehensive income not only has an impact on the articulation relationship, but also may increase the workload of corporate employees, increase employee work stress and reduce work efficiency, which ultimately affects the financial performance of the company.

Therefore, the second hypothesis of this paper is based on the impact of other comprehensive income reform on financial information and corporate employees.

H2: Other comprehensive income reform will weaken the impact of internal control on corporate financial performance.

4. Study Design

(1) Sample Selection and Data Sources

In this paper, the sample of listed companies in Shanghai and Shenzhen A-shares from 2013-2021 is used as the research sample, and the data of internal control deficiencies and corporate financial data are obtained from CSMAR database. In this paper, the sample enterprises are screened as follows: (1) exclude the sample enterprises in the financial and real estate categories because the capital structure of these sample enterprises is significantly different from other enterprises; (2) exclude the ST and ST* sample enterprises; (3) exclude the enterprises with missing sample data; and (4) exclude the sample enterprises with capital indebtedness ratio (Lev) greater than 1. Finally, 43,418 sample observations are obtained. In order to eliminate the effect of extreme values, this paper performs Winsorize treatment for all continuous variables at 1% and 99% quantile points.

(2) Empirical Model and Variable Description

1. Model Construction

To test the impact of the effectiveness of internal control on the financial performance of enterprises, build a regression model 1:

$$CFP_{i,t} = \alpha_0 + \alpha_1 ICMW_{i,t} + \alpha_2 Controls_{i,t} + \sum Industry + \sum Year + \varepsilon_{i,t} \qquad (1)$$

Where: $CFP_{i,t}$ is the financial performance of firm i in the t fiscal year. For the measurement of the financial performance of a company, one is market-based method, such as Tobin's *Q*, and the other is accounting-based method, such as return on total assets (*ROA*), return on net assets (*ROE*). Based on the specificity of China's capital market, this paper adopts return on total assets (*ROA*) as an indicator to measure the financial performance of enterprises.

$ICMW_{i,t}$ is a dummy variable for significant deficiencies in internal control, with a value of 1 if there are significant deficiencies in internal control and 0 otherwise. Existing studies have mostly used three approaches to measure the effectiveness of internal control in enterprises. In this paper, we use whether an enterprise discloses deficiencies in internal control as the criterion for determining the effectiveness of internal control. When the internal control self-evaluation report discloses the existence of deficiencies, internal control is determined to be ineffective; when the internal control self-evaluation report discloses no deficiencies, internal control is determined to be effective.

$Controls_{i,t}$ are a set of control variables. In addition to the effect of internal controls on the financial performance of firms, the sample firms' own characteristics also affect the financial performance. Thus, this paper controls for variables such as firm size (*Size*), Tobin's *Q* (*TBQ), gearing* ratio (lev), operating income growth rate (*Gg*), price-to-earnings ratio (*TTM*), sole director ratio (*Ldp*), and board size (*Bz*).

∑Industry denotes industry fixed effects to control for the effects of a set of characteristics that do not vary over time but vary with industry; ∑*Year* denotes annual fixed effects to control for a set of effects that vary over time; and $\varepsilon_{i,t}$ is a random disturbance term.

To test the moderating effect of other comprehensive income reform on internal control affecting corporate financial performance, model 2 was constructed.

$$CFP_{i,t}=\alpha_0+\alpha_1 ICMW_{i,t}+\alpha_2 OCI+\alpha_3 OCI*ICMW+\alpha_4 Controls_{i,t}+\sum Industry+\sum Year+\varepsilon_{i,t} \quad (2)$$

Where: *OCI* is the moderating variable. Other comprehensive income is used as a moderating variable for the impact of internal control on corporate financial performance to explore the effect of other comprehensive income reform on the relationship between internal control and corporate financial performance due to the formal introduction of the other comprehensive income account in 2014 when the standard was issued. *OCI*ICMW is the* interaction term and is the variable of most interest in model (2). The other variables are defined in a manner consistent with model (1). All variables used in the model are presented in Table 1.

Table 1 Variable definition table

	Variable symbols	Variable name	Variable calculation method
Explained variables	*CFP*	Financial performance	ln return on total assets(*ROA)*
Explanatory variables	*ICMW*	Internal control	1 for significant deficiencies in internal control, 0 otherwise
Control variables	*Size*	Enterprise size	ln total assets at the end of
	TBQ	Tobin Q	Market value/replacement cost of assets
	Lev	Gearing ratio	Total Liabilities/Total Assets
	Gg	Operating income growth rate	(Current period operating revenue - Previous period operating revenue)/Previous period operating revenue*100%
	TTM	P/E ratio	Share price/earnings per share
	Ldp	Proportion of independent directors	Percentage of independent directors on the board
	Bz	Board Size	Actual number of board of directors
Adjustment variables	*OCI*	Other comprehensive income	0 before the change, 1 after the change

5. Results and Analysis

(1) Descriptive Statistics

Table 2 Statistical description of the variables

Variables	Mean value	Standard deviation	Maximum value	Minimum value
CFP	0.061	0.531	0.275	0.001
ICMW	0.346	0.476	1.000	0.000
Size	22.006	1.267	25.779	19.461
TBQ	1.931	1.290	8.765	0.865
Lev	0.406	0.198	0.854	0.169
Gg	0.188	0.397	2.606	-0.554
TTM	75.276	132.958	943.409	5.648
Ldp	36.853	5.321	57.140	25.000
Bz	8.864	1.803	15.000	5.000

The results of descriptive statistics from the variables are shown in Table 2, from which it can be seen that: the mean value of internal control is 0.346, which indicates that the overall level of effectiveness of internal control of listed companies in China is not high and needs to be further strengthened. The mean value of financial performance (*CFP*) is 0.061, the maximum value is 0.275, and the minimum value is 0.001, with a wide gap in the level of financial performance, which is consistent with the relevant data of the overall listed companies in China, indicating that the sample companies selected in this paper are somewhat representative. As for the main control variables, the mean value of capital indebtedness ratio (*Lev*) of the sample companies is 0.406, which indicates that the average debt level of the sample companies is low; the mean value of operating income growth rate of the sample companies is 0.188, which indicates that the average business ability and growth ability of the sample companies are good, the maximum value is 2.606, and the minimum value is -0.554, which indicates that the growth gap between the sample companies is larger.

(2) Main Test Results

Column (1) in Table 3 is tested by regression according to model (1), and the regression results in Table 3 show that the F-value of the model is 19.44 and the explanatory power of the model is good. Internal control is significantly and positively correlated with corporate financial performance at the 1% level, and hypothesis H1 is verified that there is a significant positive effect of the overall effectiveness of internal control on financial performance. That is, the higher the overall effectiveness of internal control, the higher the ROA of total assets. The Gearing ratio among the control variables is significantly negatively related to corporate performance, and financial expenses add to the cost burden and drag down corporate performance. Operating income growth rate is significantly and positively correlated with corporate performance. Operating income is the basis for long-term stable profitability of the company and promotes the growth of corporate performance.

Column (2) in Table 3 is tested by regression according to model (2), and the regression results show that the F-value of the model is 19.56 and the explanatory power of the model is good. After introducing the moderating variable *OCI* and the interaction term *OCI*ICMW*, the interaction term is significantly and negatively related to corporate financial performance and hypothesis H2 is verified. The change in other comprehensive income not only confuses the financial information but also increases the workload and work stress of the company's employees, which in turn will reduce the financial performance of the company.

Table 3 Main test results

	ROA	
	(1)	(2)
ICMW	0.002^{***} (3.36)	0.002^{***} (2.58)
OCI		-0.002 (-1.53)
*OCI*ICMW*		-0.002^{***} (-2.03)
TTM	-0.000^{***} (-63.39)	-0.000^{***} (-62.50)
Lev	-0.032^{***} (-25.45)	-0.033^{***} (-26.15)
Size	-0.006^{***} (-21.16)	-0.003^{***} (-9.77)
TBQ	0.008^{***} (46.96)	0.009^{***} (48.52)
Gg	0.008^{***} (18.29)	0.008^{***} (17.12)
Bz	0.001^{***} (4.69)	0.001^{***} (2.89)
Ldp	0.000 (1.35)	0.000 (1.14)
Adj.R^2	0.5442	0.5459
F	19.44	19.56

Note: t-values are in parentheses
* represents p-value between 10% and 5%, ** represents p-value between 5% and 1%, *** represents p-value less than 1%

(3) Grouped Test

In this paper, the sample firms are divided into two groups according to the size of the firms: the sample data with firm size above the median are defined as the large firm group; the sample data with firm size below the median are defined as the small firm group. In this way, we explore whether the regression results of the previous paper in different sizes will produce differences. The regression results of the subgroups are listed in Table 4.

Table 4 Grouped test results

	ROA	
	（1）	（2）
ICMW	0.002^{**} （2.18）	0.001^{*} （1.64）
TTM	-0.000^{***} （-46.00）	-0.000^{***} （-34.43）
Lev	-0.02^{***} （-9.49）	-0.034^{***} （-20.21）
Size	-0.009^{***} （-13.35）	-0.005^{***} （-11.84）
TBQ	0.007^{***} （27.55）	0.011^{***} （33.19）
Gg	0.008^{***} （11.95）	0.006^{***} （10.79）
Bz	0.001^{***} （3.18）	0.001^{***} （3.20）
Ldp	-0.000 （-0.10）	0.000^{**} （2.35）
Adj.R^2	0.5629	0.5811
F	12.40	17.50

Note: t-values are in parentheses
* represents p-value between 10% and 5%, ** represents p-value between 5% and 1%, *** represents p-value less than 1%

The results from the grouped regressions show that firm size does have an impact on the relationship between internal control and firm financial performance: the regression results for smaller firms are in column (1) of Table 4, and the regression results for larger firms are in column (2) of Table 4. The results in the table show that the effect of internal control on the financial performance of the larger firms is not significant; while the effect of internal control on the financial performance of the smaller firms is relatively significant. This may be due to the fact that the internal control of small enterprises is poor compared to that of large enterprises, therefore, once small enterprises pay attention to internal control and strive to improve the level of internal control, the financial performance of enterprises will be significantly improved and enhanced accordingly.

(4) Endogeneity Test

The relationship between internal control effectiveness and corporate financial performance may be affected by endogeneity. First, this paper measures the effectiveness of internal control by whether the disclosure of material deficiencies in internal control is made in the self-evaluation report of the enterprise's internal control, while the management of some enterprises may be reluctant to disclose material deficiencies in internal control after weighing the pros and cons, which may lead to self-selection bias in the study sample. Based on this, this paper uses the 2sls approach to address the possible endogeneity between variables. Referring to existing research (Zhang Chao and Liu Xing, 2015), this paper uses a regression approach to test the effect of lagged one-period internal control on corporate financial performance. The regression model is constructed as follows.

$$ICMW_{i,t} = \alpha_0 + \alpha_1 ICMW_{i,t-1} + \alpha_2 Controls_{i,t} + \sum Industry + \sum Year + \varepsilon \quad (3)$$

$$CFP_{i,t} = \alpha_0 + \alpha_1 ICMW\_hat_{i,t} + \alpha_2 Controls_{i,t} + \sum Industry + \sum Year + \varepsilon \quad (4)$$

The results of the endogeneity test are presented in Table 5. Internal control after being treated with instrumental variables remains significantly and positively related to the financial performance of the firm in the current period, proving that our results remain robust after accounting for endogeneity issues.

Table 5 Endogeneity test results

	ICMW	*ROA*
$ICMW_{i,t-1}$	0.689*** (188.81)	
ICMW_hat		0.001*** (2.03)
TTM	-0.000** (-2.57)	-0.000*** (-57.44)
Lev	0.007* (0.76)	-0.031*** (-23.31)
Size	-0.020*** (-9.41)	-0.005*** (-17.38)
TBQ	0.001 (0.89)	0.008*** (43.99)
Gg	0.010*** (3.02)	0.009*** (18.39)
Bz	0.004** (2.48)	0.001*** (4.51)
Ldp	-0.000 (-0.41)	0.000 (1.26)
Adj.R^2	0.792	0.5529
F	53.83	18.36

Note: t-values are in parentheses
* represents p-value between 10% and 5%, ** represents p-value between 5% and 1%, *** represents p-value less than 1%

(5) Robustness Test

In order to test the reliability of the empirical results, the robustness test is conducted in this paper: due to the impact of the global economic crisis in 2018, which may have an impact on our empirical results, we exclude the sample data in 2018 and obtain the results listed in Table 6. the final robustness test results are consistent with the previous regression results, indicating that the model in this paper is relatively robust and the research results are robust.

Table 6 Robustness test results

	ROA
ICMW	0.002** (2.28)
OCI	-0.003* (-1.80)
*OCI*ICMW*	-0.002* (-1.82)
TTM	-0.000*** (-61.42)
Lev	-0.033*** (-25.55)
Size	-0.003*** (-8.04)
TBQ	0.009*** (48.11)
Gg	0.007*** (16.29)
Bz	0.001*** (2.73)
Ldp	0.000 (0.89)
Adj.R^2	0.5493
F	19.39

Note: t-values are in parentheses
* represents p-value between 10% and 5%, ** represents p-value between 5% and 1%, *** represents p-value less than 1%

6. Conclusion and Implications

This paper conducts a regression analysis with the financial data of Shanghai and Shenzhen A-share listed companies from 2013-2021, using return on total assets (*ROA*) as a measure of corporate financial performance, internal control (*ICMW*) as the main explanatory variable, and other comprehensive income reform as the moderating variable, to explore the impact of internal control on corporate financial performance and the impact of other comprehensive income reform on internal control on the moderating effect of corporate financial performance, and conclude that (1) internal control has a positive effect on corporate financial performance. (2) Other comprehensive income reform will weaken the impact of internal control on corporate financial performance.

China also continues to promote the improvement of the internal control system of enterprises, and listed companies have begun to gradually strengthen the construction of internal control, improve the internal control system and information disclosure, improve the efficiency and effectiveness of business operations, and promote the realization of development strategies. This paper makes the following suggestions based on the empirical results: (1) Enterprises should adjust the internal control system according to their own reality. To build an enterprise internal control system, enterprises should fully consider their realistic situation and actual needs, and build an internal control system that conforms to the spirit of internal control and has their own characteristics according to different industries, scale and nature. (2) Increase the comprehensive and real-time supervision of the enterprise's financial activities. Enterprises should establish and improve the effective mechanism of internal control supervision, strengthen the inspection and supervision of financial information content and internal control quality, fully realize the financial information management based on the internal control system

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