A research on the correlation between internal control quality and financial performance

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Abstract: We select 1931 Shanghai and Shenzhen A-share listed companies and 9655 groups of data during 2012-2016 as the research sample. Then we use DIB China listed company internal control index as the measure of internal control quality. We also establish a comprehensive financial performance index from debt-paying ability, operation capacity, profitability and development ability to evaluate financial performance. Next we empirically study the correlation between internal control quality and financial performance in accordance with the total samples and the industry samples. We find that internal control quality is significantly related to corporate financial performance on the whole. However, the influence is different between different industries and the correlation in technology-intensive industries is greater than that in capital-intensive industries and labor-intensive industries.

1. Introduction
The appearance of large financial scandals at home and abroad forces countries to explore the root of financial problems. With the increasing understanding of internal control, people gradually realize that internal control plays an important role in the development of enterprises. Does internal control effectively improve corporate financial performance in the practice of corporate governance? Are there differences in the influence of internal control on financial performance in industries with different proportions of factors of production? At present, scholars have given different answers to the first question, but few researches on the second question. In view of this, based on the data of Shanghai and Shenzhen A-share listed companies from 2012 to 2016, this paper respectively examines the correlation between internal control quality and financial performance of the overall samples and the industry samples. For one thing, this paper makes up the gap of comparative analysis in different industries in terms of internal control theory, and further widens the research perspective. For another, this study provides theoretical guidance for listed companies to improve internal control, and also puts forward corresponding suggestions for listed companies in different industries to improve financial performance, which is of great significance for the stable development of enterprises.

2. Literature Review
The related researches are mainly around internal control information disclosure to explore the relevance of internal control weaknesses and enterprise performance, capital cost, stock price. Doyle, J.T. et al. (2007) believed that internal control problems were the root cause of low level of accrual quality and companies with poor internal control usually had low accrual quality, which was related to material weaknesses at the company level, but not at a specific account level [1]. Stoel, M.D. et al. (2011) found that IT internal control weaknesses weakened the relationship between accounting earnings and market
value, and the enterprises with IT internal control weaknesses had lower accounting earnings and price-earnings ratio [2]. Klamm, B.K. et al. (2012) believed that the companies with material weaknesses in internal control had low profitability, earnings quality or stock market returns, and the material weaknesses in subsequent years were negatively correlated with return on assets [3].

Some studies have found that there is a positive correlation between internal control quality and financial performance (Zhang, M. et al., 2017) [4]. Xu, L.J. et al. (2016) found that the six measures of internal control were positively correlated with financial performance [5]. Huang, X.L. et al. (2017) found that internal control and financial performance had significant positive correlation both in the overall samples and in the industry samples, but the influence in capital-intensive industries performed significantly weaker. They guessed that the quantity and quality of people might affect the implementation effect of internal control [6].

Studies have also demonstrated that internal control quality has no significant impact on financial performance. Based on Contingency Theory, only when internal control fits enterprise environment will show a significant correlation (Zhang, Sh.P., 2011) [7]. For the financial performance of accounting basis and market basis, the impacts are significantly different (Li, G.Sh. et al., 2015; Zhang, G.Q. et al., 2015) [8-9]. In addition, some scholars have verified that there are significant differences among enterprises with different ownership nature (Ye, Ch.G. et al., 2016) [10].

3. Hypothesis Development

Due to the different objectives and interests of owners and operators, owners need to design a set of appropriate internal control system to restrain operators’ behaviors to maximize the benefits of both parties. Therefore, high-quality internal control can relieve the principal-agent problem, reduce the principal-agent cost of enterprises, and guarantee the smooth development of enterprise operation, so as to achieve the effect of improving the financial performance of enterprises. At the same time, based on Signalling Theory, the enterprises with high internal control quality tend to fully disclosure corporate information to the market. According to the information having been disclosed, internal users can find the problems existing in the enterprise and make further improvement, and external users can make more fair evaluation to the enterprise, which will greatly reduce the management cost and financing cost and will promote the ascension of financial performance. Therefore, we expect the following:

**H1:** Internal control quality is positively correlated with financial performance.

At present, the basic standards of internal control in China are uniformly applicable to listed companies in various industries, but there is no internal control standards of subdivided industries. Due to the proportions of labor power, capital and technology factors of production are different in different industries. Therefore the source, distribution and impact of enterprise risks are likely to be different. Additionally, the acceptance degree and implementation effect of internal control in different industries are likely to be different. Hence, the influence degree of internal control quality on financial performance may be different in different industries. Accordingly, our next hypothesis follows:

**H2:** The influence of internal control quality on financial performance is different in different industries.

4. Research Method

4.1. Sample Selection

Based on the industry classification results of listed companies in the fourth quarter of 2017, we select the data of Shanghai and Shenzhen A-share listed companies from 2012 to 2016 as the research object. The sample companies are processed as follows: (1) eliminate financial and insurance companies; (2) eliminate abnormal companies such as ST; (3) eliminate the companies listed after 2012; (4) eliminate companies with incomplete data. Finally, 9,655 groups of data were collected from 1,931 companies. The data come from the database of Tai’an and DIB internal control and risk management database. In this paper, all continuous variables are winsorized at the level of 1%-99% to reduce the impact of outliers.
4.2. Variable Selection
Relevant variables are selected based on existing researches and the condition of listed companies. The main variables in this paper are defined in table 1.

| Variable | Symbol | Variable Name | Variable Declaration |
|----------|--------|---------------|----------------------|
| Explained Variable | FP | comprehensive index of financial performance | factor analysis |
| Explaining Variable | ICI | internal control index | DIB China listed company internal control index |
| Control Variable | Lev | enterprise risk | asset-liability ratio at the end |
| Control Variable | Growth | enterprise growth | increase rate of main business revenue |
| Control Variable | Con | ownership concentration | the shareholding ratio of the top ten |
| Control Variable | Year or Ind | annual or industry dummy variable | |

4.3. Research Model
Through the above analysis, we establish the regression model of internal control quality and enterprise financial performance:

$$FP = \alpha_0 + \alpha_1ICI + \alpha_2Lev + \alpha_3Growth + \alpha_4Con + \sum \beta_iYear_i + \sum \gamma_jInd_j + \varepsilon$$

In the regression model, $\alpha_0$ is constant term, $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \beta_i, \gamma_j$ are regression coefficients, and $\varepsilon$ is random disturbance term.

5. Results

5.1. Factor Analysis
We select 11 financial indicators from debt paying ability indicators, operation ability indicators, profitability indicators, development ability indicators and per share indicators to measure company financial performance. Through factor analysis, several irrelevant comprehensive indicators replace these related multiple indicators and reflect the main information the original indicators represent. We finally calculate the comprehensive financial performance indexes.

5.2. Industry Cluster Analysis
Based on Huang, X.L.’s industries cluster analysis methods, we divide the samples into three categories: labor-intensive industries, capital-intensive industries and technology-intensive industries [6]. The detailed classification steps are listed as follows:

(1) Strip out financial industry, subdivide manufacturing industry into C0 - C9, and combine six industries, including hotels and catering services, into social services. Eventually, we get 21 industries.

(2) Calculate fixed assets ratio and research and development (R&D) ratio in 21 industries from 2012 to 2016. The calculation formulas are shown in formula (5.1) and (5.2) respectively.

$$\text{Fixed assets ratio} = \frac{\text{net value of fixed assets}}{\text{total assets}}$$

$$\text{Research and development ratio} = \frac{\text{R&D expenditures}}{\text{employee pay payable}}$$

(3) 21 industries are divided into three categories according to the proportion of factors of production.

5.3. Descriptive Statistics

Table 2. Descriptive statistics.

| The Whole Samples | L-intensive | C-intensive | T-intensive |
|-------------------|-------------|-------------|-------------|
|                   |             |             |             |

As we can see from the descriptive statistical results in table 2, there are large differences in financial performance and internal control quality among listed companies, as well as large differences in financial leverage, corporate growth and ownership concentration. In the 9,655 samples, 1,045 are labor-intensive enterprises, 4,155 are capital-intensive enterprises and 4,455 are technology-intensive enterprises. In terms of financial performance, the mean value and standard deviation of capital-intensive enterprises are relatively high, which may be related to these enterprises’ high input and high output. In terms of internal control indicators, there is little difference among the three industries. In addition, the financial leverage level of capital-intensive enterprises is relatively high, the growth of technology-intensive enterprises is relatively good, and the equity concentration is of little difference.

5.4. Correlation Analysis

Table 3. Correlation analysis.

|     | FP     | ICI    | Lev   | Growth | Con   |
|-----|--------|--------|-------|--------|-------|
| FP  | 1      | 0.076*** | 0.167*** | 0.052*** | 0.105*** |
| ICI | 0.076*** | 1      | 0.000 | 0.000 | 0.000 |
| Lev | 0.167*** | 0.000 | 1     | 0.000 | 0.000 |
| Growth | 0.052*** | 0.000 | 0.000 | 1     | 0.000 |
| Con | 0.105*** | 0.000 | 0.000 | 0.000 | 1     |

N=9655

*, **, *** indicate significance at the 0.05, 0.01 and 0.001 levels, respectively.

In table 3, the correlation coefficient between overall FP and ICI is 0.076, indicating that internal control quality is positively correlated with financial performance, and the correlation coefficient is significant at the level of 0.001. Hypothesis H1 has been verified. In addition, it can be seen that Lev is significantly negatively correlated with FP, and Growth and Con are significantly positively correlated with FP.

5.5. Analysis of Regression

Table 4. Regression analysis.

|     | The Whole | L-intensive | C-intensive | T-intensive |
|-----|-----------|-------------|-------------|-------------|
| (constan | 0.557 (1.72) | 0.936 (1.52) | 1.349**(2.81) | 0.891** (2.53) |
| ICI | 0.168*** (4.73) | 0.137 (1.62) | 0.156* (2.53) | 0.191*** (4.06) |
| Lev | -2.383*** (-) | -3.092*** (-) | -2.115*** (-) | -2.494*** (-) |
| Growth | 0.248*** (4.44) | 0.154 (0.94) | 0.474*** (4.88) | 0.047 (0.67) |
| Con | 0.846*** (5.10) | 1.127* (2.47) | 0.920*** (3.29) | 0.651** (2.97) |
| Year control | control | control | control | control |
| Ind control | control | control | control | control |
| F     | 76.12 | 10.59 | 67.48 | 56.21 |
|-------|-------|-------|-------|-------|
| Adj-R²| 0.179 | 0.107 | 0.204 | 0.139 |

*, **, *** indicate significance at the 0.05, 0.01 and 0.001 levels, respectively.

The full samples in table 4 further support hypothesis H1. According to the industry samples, the correlation coefficient between ICI and FP in labor-intensive industries is 0.137, and the Sig value is 0.106, indicating that when financial performance is measured by our comprehensive index, the internal control quality in labor-intensive industries is positively correlated with financial performance, but the correlation is not significant. The correlation coefficient in capital-intensive and technology-intensive industries are 0.156 and 0.191, and the Sig value are respectively less than 0.05 and 0.001, indicating significantly positive correlations. And the correlation in technology-intensive industries is greater than that in capital-intensive and labor-intensive industries. So hypothesis H2 is true.

5.6. Robustness Test
In addition, we make a robustness test. A single financial performance indicator ROA, ROE is successively used to replace FP to further test. We found that internal control was significantly positively correlated with financial performance both in the full samples and in the industry samples. But the influence degree in different industries was different. The results showed that the influence in technology-intensive industries was the greatest, followed by that in capital-intensive industries, and the influence in labor-intensive industries was the least. The robustness of the results was further guaranteed.

6. Conclusion
This paper finds that internal control quality and financial performance have significantly positive correlation on the whole. However, the impact intensity varies by industry. We think enterprises should strengthen the investment of human, financial and material resources in internal control to give full play to the positive role of internal control in improving enterprise performance. Technology-intensive enterprises should pay attention to strengthening internal control construction. For mature labor-intensive enterprises, on the premise of ensuring the high quality of internal control, attention should be paid to cultivating the core competitiveness and improving the comprehensive level of enterprises. Considering the small proportion of labor factors and the stage of transformation and upgrading, capital-intensive enterprises should strive to overcome the obstacles when implementing internal control, and establish the internal control system consistent with its own characteristics.

The deficiencies of this paper lie in: (1) We haven’t obtained all the samples of R&D expenditures data; (2) The significance of the differences and the reasons for the differences need to be further tested.

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