



# Research on Financial Management Countermeasures Based on Multi-Indicator Model and Internal Control Theory and Analysis of Improvement Results

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## Abstract

With the continuous development of China's market economy, enterprises are facing increasingly fierce competition at home and abroad. The widespread use of enterprise information technology, the rapidly changing international environment and the change of people's thinking have made financial management the frontline of enterprise risk control. This paper systematically studies the financial internal control problems and improvement countermeasures of the case company through theoretical analysis and multi-indicator modeling; and predicts and analyzes the effects of financial management and financial internal control improvement measures of the case company based on field survey data to verify the high applicability of countermeasures and lay a good foundation for the long-term healthy and sustainable development of the enterprise. The problem studied in this paper is to find an internal control method of financial management based on scientific and pragmatic theories and suitable for the case company's own characteristics, so as to provide theoretical and methodological support for the case company's scientific decision-making and financial management improvement.

**Keywords-** *Financial Forecasting; Financial Early Warning; Internal Control; Countermeasure Research*

## 1. INTRODUCTION

Internal control in financial management is increasingly valued by enterprises and applied in practice. However, traditional financial management methods are inevitably interfered by many human irrational factors for various reasons, and these factors will, to varying degrees, have an impact on the effectiveness of financial management, leading to poor management results and even causing losses to the enterprise, and thus losing the meaning of financial management in practice. How to use scientific methods to reduce the impact of these irrational factors on financial management as much as possible is an urgent problem that many companies need to solve. The case company in this paper, as a state-controlled high-tech enterprise, has embarked on the path of self-financing development after becoming independent from the administration of the original institution. With this as the starting point, this paper will focus on the financial internal control problems and improvement countermeasures of the case company based on the

financial data bits of the case company in 2018 and 2019. In addition, an early warning analysis of the case company's financial situation based on single-indicator and multi-indicator models will be conducted, aiming at a professional analysis of the effectiveness of the case company's financial management and financial internal control improvement.

## 2. INTERNAL CONTROL AND FINANCIAL MANAGEMENT RELATED THEORY

### 2.1 Internal Control Theory

Internal control is an emerging cross-cutting discipline that is a process designed by corporate management to achieve certain goals for the business and implemented by the board of directors, management, and other personnel. Internal control minimizes process errors, manages profits, identifies errors, and provides effective and comprehensive true financial reporting. The subjects of internal control in the design, implementation, assessment and evaluation include the administrative

leadership of the unit, each functional department and related personnel, and the main content of internal control can be the internal economic and business management activities [1]. The establishment, implementation, inspection, testing and evaluation of the internal control system is a common concern of modern management science and modern auditing. The main objectives of internal control include: ensuring the effectiveness and efficiency of business operations, legal compliance, truthful and reliable reporting, and achieving the strategic goals of the enterprise [2]. Therefore, the purpose of internal control in enterprises is to ensure the legality of production and operation, the validity of accounting reports and related information, improve the efficiency of business operations, and promote the achievement of the established development goals of the enterprise.

## ***2.2 Financial Management Theory***

Financial management and internal control are closely linked, and through the regulation and restraint of internal control, the efficiency of financial management can be improved and the realization of financial management objectives can be guaranteed. Financial management refers to a type of work of financial management activities, regulation and balance of financial relations in accordance with the relevant financial regulations and guidelines of financial management, and is one of the main components of management. Its basic content is related to the purchase of assets, financing, management of cash flow and revenue allocation in operation, which is one level higher than accounting [3]. The overall goal of financial management is to maximize the value of the enterprise, to use the best financial strategies for legal operations, to analyze in detail the relationship between risk and reward and the value of money in time, and to ensure that the enterprise continues to grow at a high rate, so as to maximize the value of the enterprise.

## **3. A STUDY OF FINANCIAL INTERNAL CONTROL PROBLEMS AND IMPROVEMENT COUNTERMEASURES IN A COMPANY AS AN EXAMPLE**

### ***3.1 Summary of financial internal control and financial risk issues of the case company***

Although the main business revenue, total profit and net profit of the case company have been steadily increasing year by year in the past ten years, the analysis reveals that the case company has problems in financial forecasting, financial early warning, internal decision-making process and internal control measures of corporate culture construction [4], which seriously affects the future healthy and sustainable development of the enterprise and urgently needs reasonable financial

management and financial internal control measures for improvement. The main problems in financial internal control are as follows:

- The case company has financial forecasting problems, which are manifested in the lack of input-output correlation analysis of human resources and fixed assets, and the lack of scientific budget targets leading to poor budget enforceability.
- The case company has problems such as loss of departmental projects and long turnover days of accounts receivable, etc. The company lacks risk identification and early warning mechanism, which makes the financial data lose its meaning and further-. This further affects the scientific decision-making of the company.
- The case company has problems in both internal decision-making process and corporate culture construction, which affects the operating capacity of the company and constitutes a financial risk for the company.

### ***3.2 Case company financial management and financial internal control improvement measures***

#### ***3.2.1 Financial forecasting improvement measures***

Financial forecasting is a basic prerequisite for financial decision making and financial planning. According to the analysis in Chapter 3, the case company lacks the qualitative analysis of human resources input and fixed assets input, and the inaccurate budget target leads to the preparation of empty content [5]. Therefore, this section will analyze the case company's financial forecast qualitatively, find out the inner connection between human resource input, fixed asset input and operating income, lay the foundation for scientific financial decision-making, and put forward specific suggestions to strengthen the standardization of the budget preparation process and improve the level of budget assessment to strengthen the case company's financial budget level.

#### ***3.2.2 Study of financial early warning methods for the case company***

Establishing an early warning system for enterprises is a key measure to reduce financial risk, but since the case company lacks a suitable early warning mechanism, this section will propose a financial early warning system suitable for the case company based on financial and early warning quantitative analysis, and this section will use two models, single-indicator and multi-indicator, for financial early warning analysis.

Early warning analysis of the financial situation of the case company based on the single-indicator model: In this paper, the single-indicator model method is used to measure the financial ratio of the case company and compare the difference between the case company and

the standard financial ratio (the standard financial ratio is the assessment ratio of the case company's superior unit to its subordinate units). The single-indicator model analysis of the financial data of the case company in 2018 can produce the calculation results, as shown in Table 1.

**TABLE 1 FINANCIAL RATIO ANALYSIS MODEL RESULTS**

Project	Standard Financial Ratios	Corporate Financial Ratios	Variance	Comparative Results
Current Ratio	2.30	1.82	-0.48	-
Quick Ratio	1.44	1.75	0.31	+
Accounts Receivable Turnover Ratio	2.21	2.85	0.64	+
Total Assets Turnover Ratio	0.35	0.50	0.15	+
Gearing Ratio	0.24	0.63	0.39	+
Equity Ratio	1.13	1.47	0.34	+
Tangible net worth debt ratio	0.65	1.47	0.82	+
Interest earned multiple	213.00	423.00	210.00	+
Gross sales margin	0.62	0.59	-0.03	-
Net sales margin	0.35	0.51	0.16	+
Return on assets	0.28	0.19	-0.09	-
Return on equity	0.24	0.44	0.20	+

According to Table 1, by comparing the financial ratios with the assessment standards of the parent unit, it can be concluded that the case company has a strong solvency, a low gearing ratio, and no short-term borrowing and long-term debt, and a good debt structure; the case company has a good asset management ratio, no long-aged accounts receivable, and no bad debt losses, and a fast turnover of total assets, which indicates a strong operating capacity: In terms of profitability, the case company's profitability and remuneration ratio are low, and the index results show that the case company can improve in terms of controlling costs and enhancing the added value of products, thus increasing profit margins.

The case company formulated a four-level early warning mechanism for seven key financial indicators such as current ratio, accounts receivable turnover, total asset turnover, gearing ratio, interest acquisition multiple, net sales margin, and return on assets, and designated the

Finance Division to issue the Financial Indicator Analysis Report at the end of each month to provide early warning for the relevant indicators.

*3.2.3 Measures to improve the management of financial internal control of the case company*

Based on the above analysis, the case company should strengthen the non-financial internal control in both internal decision-making process and corporate culture building. Different levels of managers in the company have different control rights and responsibilities, and there is a relationship between adjacent levels to control and be controlled. Therefore, the development of a rational and efficient corporate decision-making process is an indispensable part of the internal management of a company. Therefore, after analysis, a new financial decision-making process was developed for the case

company, as shown in Figure 1, in order to take into account both the efficiency of the company's operations and the principle of corporate control.

#### 4. USING THE TEMPLATE

Chapter 3 of this paper proposes improvement measures for financial forecasting, financial warning and financial internal control management of the case company, and this chapter will evaluate the specific implementation effects of these improvement measures based on the financial data of the case company in 2019 (Zhongrui Yuehua Audit No. [2016] 01350017).

#### 4.1 The effect of improving the financial forecasting system of the case company

According to the analysis, this paper proposes a forecasting model for the operating income of the case company, and the forecasting formula is:

$$y = -312543 + 133.92t - 932.4h + 0.5293th - 0.05532h^2 \quad (1)$$

The case company has standardized the budgeting process and improved the level of budget assessment since the beginning of 2019, and this section will use the financial forecasting model equation 1 derived above to forecast and analyze the operating income for 2019, and the forecast results and errors are shown in Table 2.

**TABLE 2 CASE COMPANY 2019 OPERATING INCOME FORECAST RESULTS**

Year	Human resource input (million yuan)	Operating income forecast (RMB million)	Actual value of operating income (RMB million)	Absolute error (RMB million)	Relative error
2019	635	2805	2844	39	1.39%

According to Table 2, the colored surfaces represent the case company's operating income values predicted by the forecasting model, and the blue dots represent the actual observed values. Combined with the analysis in Table 3, the actual annual revenue value of \$28.03 million in 2019 is slightly higher than the forecast value of \$27.68 million, with an absolute error of \$350,000 and a relative error of 1.26%, and the forecast results are more accurate, which indicates that the forecast model derived from the analysis is a more suitable forecast method for the case company at present [6]. Meanwhile, the enhanced financial budget management measures implemented by the case company starting in 2019 have contributed to the rapid growth of the case company's operating income, which may be a reason why the

operating income in 2019 is slightly higher than the actual forecast value.

#### 4.2 Effectiveness of implementing financial early warning measures for the case company

##### 4.2.1 Early warning analysis of the financial situation of the case company based on the single-indicator model

After the single indicator model analysis, the results of the financial ratios of the case company are shown in Table 3.

**TABLE 3 FINANCIAL RATIO ANALYSIS MODEL RESULTS**

Project	Standard Financial Ratios	2018 Financial Ratios	2019 Financial Ratios	Change trends compared to 2018
Current Ratio	2.30	1.82	4.10	+
Quick Ratio	1.44	1.75	3.92	+
Accounts Receivable Turnover Ratio	2.21	2.85	3.55	+
Total Assets Turnover Ratio	0.35	0.50	0.63	+

Gearing Ratio	0.24	0.63	0.55	-
Equity Ratio	1.13	1.47	0.94	-
Tangible net worth debt ratio	0.65	1.47	0.94	-
Interest earned multiple	213.00	423.00	935.00	+
Gross sales margin	0.62	0.59	0.79	+
Net sales margin	0.35	0.51	0.63	+
Return on assets	0.28	0.19	0.19	/
Return on equity	0.24	0.44	0.52	+

According to Table 3, it can be seen that the current ratio, quick ratio, gross sales margin, net sales margin, return on assets, and return on equity have increased, while the gearing ratio and accounts receivable turnover days have decreased, compared to the financial indicators at the end of 2018 versus the end of 2019. However, in the monthly early warning analysis of seven key financial indicators of the case company in 2019, not every month's data was optimistic, and an orange warning appeared in February and March 2019 for accounts receivable turnover ratio and interest earned multiple, respectively. The Finance Department of the case company immediately issued a written notice of orange warning to remind the relevant person in charge, and your personnel reported the cause analysis report and rectification report to the board of directors. The board of directors made a decision to immediately set up a delinquency clearing office, to get a detailed grasp of some delinquent accounts, to make detailed recovery plans and arrangements, and to strengthen the management of reconciliation of current accounts. After implementing the early warning corrective measures, the case company did not have any early warning for these two indicators at the end of 2019, and other financial indicators also performed well. Therefore, a comprehensive analysis concludes that after the implementation of relevant internal control measures, the case company has significantly improved the concern of corporate financial indicators, and the situation of all indicators has improved compared with that of 2018.

#### 4.2.2 Early warning analysis of the financial situation of the case company based on a multi-indicator model

The case company's financial risk in 2019 was analyzed using a multi-indicator model that takes into account all financial ratios, of which the results of the Z calculation model are shown in Figure 1.

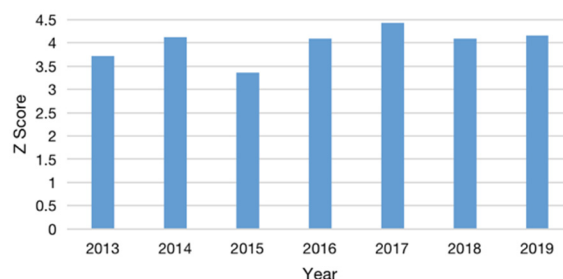


Figure 1. Case Company Z Model Calculation Results.

According to Figure 2, the calculated Z-score of the case company in 2019 is 4.03, which is slightly higher than 3.96 in 2018 and much higher than the critical value of 2.675, indicating that the case company continues to maintain a stable financial position. The DRL model was continued to analyze the financial situation of the case company in 2019, and the results are shown in Figure 2.

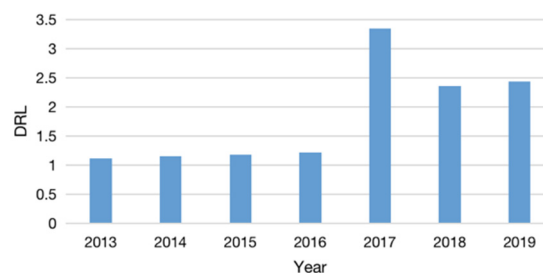


Figure 2. Case company DRL model calculation results.

According to Figure 3, the DRL value of the case company in 2019 is 2.15, which slightly increases and is greater than the judgment criterion DRL=1 based on 2018, so the DRL model concludes that the case company is in a stable financial position in 2019. In summary, both the single-indicator model and the multi-indicator model conclude that the case company is in a stable and good financial position in 2019, and no major financial risks will arise for the time being.

### ***4.3 Effectiveness of financial internal control management improvement in the case company***

In terms of decision-making process, since the case company's new financial decision-making process takes into account the existence of heterogeneous and dispersed members of the shareholders' meeting, the decision-making approval time has been reduced by 45.5% since the case company implemented the new decision-making process in 2019. It can be seen that the new decision-making process of the case company is an effective and efficient corporate internal control strategy in realizing the advantages of timely communication, unified action and efficient office of the joint party and government meeting, while ensuring the decision-making power of the shareholders' meeting on major matters such as corporate operation policy, fund raising, investment and profit distribution, which ensures the legitimacy of decision-making.

In terms of corporate culture, it is difficult to evaluate the effectiveness of the implementation of improvement measures from a quantitative perspective because there is no relatively mature theory or management practice to evaluate corporate culture. Therefore, the case company conducted an anonymous corporate culture questionnaire for employees in 2019, and most of the employees would strive to achieve the corporate goals and consciously overcome inconsistent behaviors with achieving the corporate goals. Therefore, it can be seen that after the implementation of the corporate culture enhancement measures in the case company, the corporate culture was well built and the employees were able to form a fighting force as a whole, and the corporate culture was enhanced along with the business capability of the company.

## **5. CONCLUSION**

Through theoretical analysis and practical research, this paper analyzes the causes of the financial management and financial internal control problems of the case company based on the characteristics of its business management, the mode of corporate governance structure, and its own internal control deficiencies, and proposes corresponding financial management internal control measures and evaluates the implementation of these measures quantitatively and qualitatively. The analysis of the case company's financial management internal control improvement measures reduces the negative impact of financial risks on the company's operation, which is conducive to the long-term healthy and sustainable development of the enterprise, and serves as a reference for similar high-tech SMEs.

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