

Research Article

Analysis of the Impact of Equity Incentive on Performance Management Based on Balanced Integral Method

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Improving the equity incentive system has a certain role in promoting the development of the company, but at present, there are relatively few studies on the equity incentive methods of listed companies under the balanced scorecard theory. This paper analyzes the role of equity incentive method of D listed company in enterprise performance management through the balanced scorecard theory and constructs an enterprise financial management evaluation system with qualitative and quantitative characteristics. The evaluation system includes five target layers, two dimensions, and 27 evaluation indicators. The results show that the number of researchers, the number of graduate students, market share, management fee rate, the number of chip patent applications and other internal business processes, customers, and learning and growth are better. Before the implementation of equity incentive method, the evaluation value range of primary indicators is 6–8 points. After the implementation of equity incentive method, the evaluation value range of primary indicators is 2–6 points. This study analyzes the impact of equity incentive methods on performance management through the balanced integral method, which has high application value in subsequent enterprise financial management and risk assessment.

1. Introduction

The financial situation of high-tech enterprises has been widely concerned by investors for a long time. Under the complex and changeable market environment, the probability of inefficient business performance and financial fraud has increased sharply [1]. Facing these problems, society and enterprises need to take a series of measures to improve employees' work enthusiasm and subjective initiative. As a new method of performance management, the research on balanced scorecard and enterprise performance is gradually becoming a topic of common concern among experts and scholars in the financial field [2]. The current research of balanced scorecard is mainly reflected in its role in corporate performance management, its difference from traditional performance management, practical application effect, and so on [3]. Equity incentive is a common incentive means of

the company. It distributes the company's shares to technical employees, senior managers, and company directors according to certain rules. The common types of equity incentive include restricted stock, virtual stock, stock proliferation right, and stock option. Common incentive models are divided into cash and equity models. Cash includes internal financial appreciation rights, stock appreciation rights, performance dividends, and virtual stocks. Equity models include option rights, future shares, and current shares. China's equity incentive methods have made outstanding achievements since 2006, but there is still no relatively ideal evaluation method. At present, the domestic research on equity incentive mainly focuses on the motivation analysis of equity incentive, the role of equity incentive in stakeholders, such as individuals and enterprises, different shareholding methods, improvement strategies of equity incentive, and so on. The study proposes to analyze

the effect of equity incentive methods on corporate performance through balanced scorecard.

The innovation of the research is mainly two aspects. First, it studies the joint application to the financial risk evaluation of listed companies. The combination of these two methods helps to analyze financial risks from both subjective and objective aspects, making the results more accurate and effective. Quantitative and qualitative evaluation method, which is widely used in the overall goal, is affected by multiple factors. Entropy weight method is an objective weight assignment method, which can prevent the deviation caused by human factors. Compared with the subjective assignment method, this method has higher accuracy and objectivity.

Secondly, the risk assessment of financial data of listed companies is realized with the help. The grey comprehensive evaluation method has small amount of calculation and is simple and easy to learn. It can obtain a lot of unknown information of the evaluation object through the known information and still has a good evaluation effect in the evaluation of indicators, such as difficult to quantify, irregular, and uncertain. The final result has high reliability.

This paper mainly studies from four parts. The second part mainly analyzes the current research status of employee equity incentive methods and balanced scorecard of listed companies. The third part evaluates the financial risk of listed companies through balanced scorecard, analyzing the equity incentive methods of listed companies. The fourth part analyzes the impact of equity incentive on corporate performance through financial indicators and nonfinancial indicators. The last part evaluates the results and puts forward the shortcomings and future prospects of the research.

2. Related Works

Duman et al. proposed a method combining balanced scorecard and analyzing network public relations process. The results show that the proposed method can promote the sustainable development of enterprises and improve the profit margin of the company [4]. In order to understand the implementation of performance audit, Muda et al. analyzed the performance audit of tebing government in Gaocheng town through the balanced scorecard. The case analysis results showed that the performance audit in this area was not carried out in strict accordance with the corresponding terms, mainly because the implementation conditions of counties and cities were limited, and many employees did not come from audit and economy related majors [5]. Hahn and Figge analyzed the structure of the sustainable development balanced scorecard from two aspects, including the analysis of the sustainable development balanced scorecard from three aspects: positive results from the social level, complexity and tension, heterogeneity and competitive logic, and whether the sustainable development balanced scorecard is important or not. Through a large number of arguments, the results show that the balanced scorecard for sustainable development is not a suitable tool to realize the change of sustainable development strategy beyond gradualism [6]. Rababah and Bataineh analyzed the correlation

between organizational culture and the balanced scorecard through factor analysis and logistic regression. Using the questionnaire analysis of Jordanian industrial enterprises, they found that cultural factors had a significant positive impact on the implementation of the balanced scorecard, and team orientation, innovation, and mission had a significant impact on the implementation of the balanced scorecard. However, the study did not find the relationship between "result orientation and attention to detail" and the implementation of balanced scorecard [7]. Hansen and Schaltegger analyzed the literature review of the balanced scorecard for sustainable development, constructed an architectural typology of the design, implementation, use and development process of the balanced scorecard for sustainable development, and considered the measurement of performance results and fundamental or transformative changes at the level of man-land system. The empirical research results show that sustainable development balanced scorecard management tool plays a very important role in the process of enterprise development. It plays an important role in the formulation of enterprise sustainable development strategy [8]. Pratikno and Rahardjo improved their development strategy with the help of the balanced scorecard method and the company's performance in development performance evaluation. The performance measurement results from the financial perspective showed that the return on net assets fluctuated from 2017 to 2019 and the return on investment fluctuated from 2017 to 2019. The results of the customer satisfaction survey showed that the satisfaction was 69.27%, which was at a high level. From the perspective of internal business process, the operation process is efficient, consistent, and timely [9].

Aiming at the problems existing in the introduction of management decision-making under the background of reasonable and measurable risk, Banabakova and Georgiev put forward a method to change and improve the balanced scorecard for efficient organizational management. This is a very practical management tool when the social environment remains unchanged [10].

According to the analysis of Dhameeth and Diasz, using the method of literature review, this paper discusses the motivation of management accountants' investment when using the balanced scorecard to measure organizational performance. The results show that there is a mismatch between enterprise strategy and internal capabilities and skills, and the financial perspective cannot predict and improve financial performance [11]. Alnoukari proposed a new framework to integrate big data into the strategic management process based on the balanced scorecard method. The results show that the constructed big data integration framework is practical and feasible [12]. Liu et al. analyzed the data of some listed companies and verified the regulatory effect of the company's market investment behavior [13]. Xu analyzed the role of blockchain technology in equity incentive. The example analysis results show that blockchain technology is conducive to improving the credibility of enterprises and enhancing employees' trust in enterprises, which can really play an incentive role [14]. Shen et al. proposed an equity based node allocation strategy and designed a

decentralized algorithm to realize the strategy. The evaluation results show the effectiveness and efficiency of the strategy to promote user cooperation and jointly maintain reliable content storage [15].

From the above research results, it can be concluded that the existing balanced scorecard has been widely used in the financial field, but its research on equity incentive methods of employees in listed companies is relatively few, and the relevant research results have not received extensive attention. The research analyzes the equity incentive methods of employees of listed companies through the balanced scorecard in order to improve the work enthusiasm of employees of listed companies and then provide new ideas and directions for the realization of high returns of listed companies.

3. Equity Incentive Plan and Evaluation of Employees of Listed Companies

3.1. Equity Incentive Plan and Balanced Scorecard for D Employees of Listed Companies. The traditional performance evaluation implemented by enterprises is a financial method based on the financial statements of enterprises. The main core links form the measurement system of enterprise evaluation performance. The traditional financial evaluation standard and system cannot meet the new requirements of the current industry for strategic performance appraisal. The balanced scorecard is a strategic evaluation and management system. It transforms the enterprise strategy into four balanced aspects so that the organization can create the ability necessary for long-term development while paying attention to finance. In terms of content, however, it retains the internal of the financial level in the traditional financial performance and improves the single financial system with performance as the main evaluation index. Compared with the highly developed social demand performance management system, the new characteristics mainly include unifying personal goals and departmental goals with the strategic development of the enterprise. The balance between financial indicators and nonfinancial indicators and short-term objectives and long-term objectives attaches importance to overstandard management.

Taking listed company D as the research object, this paper analyzes the equity incentive plan of employees of listed companies under the balanced scorecard. Company D is a high-tech communication company integrating R&D, design, production, sales, and service. Its main business includes electronic security products, explosion-proof industrial communication products, monitoring products, and other high-tech products. Its business scope has spread over more than a dozen countries around the world. The company's current equity incentive plan is affected by the policy environment, economic environment, and cultural and social environment External environmental impact of various technologies [16] [M]. Company D currently has 112 employees, accounting for 70.98% with bachelor's degree or above, 30% with master's degree, and 18% with doctor's degree. The subjects of the study were employees above the supervisor level and employees with bachelor degree or

above. The organizational structure of the company includes the shareholders' meeting, the board of directors, the general manager, the board of supervisors, the personnel department, the finance department, the marketing department, the quality department, the production department, the procurement department, the R&D department, and three subsidiaries. The total number of natural person shareholders is 224. The ESOP structure of company D is shown in Figure 1. The number of high-level, middle-level, and R&D backbone shareholders is 30, 24, and 32, respectively, and the corresponding proportions are 13.39%, 21.43%, and 28.57%, respectively.

There are three corporate shareholders of company D, represented by branch 1, branch 2, and branch 3, respectively, and the corresponding contribution amounts are RMB 25 million, RMB 8.75 million, and RMB 6.58 million, respectively. Since its establishment in 1997, company D has implemented three equity incentive plans in total. The research mainly analyzes the third phase of equity incentive plan in 2019, as shown in Figure 2. The stock option of the third equity incentive plan in 2019 has a waiting period and an exercise period of 2 and 3 years, respectively. The exercise price of stock options is set at 17.06 yuan/share. The exercise condition is to take the net profit of 385 million yuan as the net profit, and the corresponding minimum profits from 2019 to 2021 shall be 421 million yuan, 459 million yuan, and 492 million yuan. It is worth mentioning that the total net profit of the company in the next three years should exceed 1378 million yuan.

Company D needs to sign an agreement with shareholders and enjoy corresponding rights and interests according to the amount of capital contribution. Figure 3(a) refers to the statistics of equity incentive employees of company D at different development stages. The number and proportion of equity incentive objects will be significantly adjusted downward, gradually decreasing from the initial 70.98% to 1.78%. Figure 3(b) refers to the survey results of employees' satisfaction with salary in company D. It can be seen that most employees are satisfied with the current salary, with a satisfaction of 82.14%.

The balanced scorecard used in the study is a performance appraisal method based on strategic management. It counts and manages performance through specific index values and target values [17]. The balanced scorecard should have the goal balance of learning and growth, internal operation, customers, and finance [18]. The application of balanced scorecard in enterprise strategic management needs to achieve the following four balances: result indicators and process indicators; internal and external organization [19]. The four levels of the balanced scorecard represent three main stakeholders: employees, customers, and shareholders. For internal operation, the main indicators are after-sales service process, business process, and enterprise reform and innovation process [20]. In terms of learning and growth, the specific indicators are skill increase, employee training, employee retention rate, and employee satisfaction.

Based on the experience of traditional experts, the enterprise financial operation evaluation indicators are shown in Figure 4.

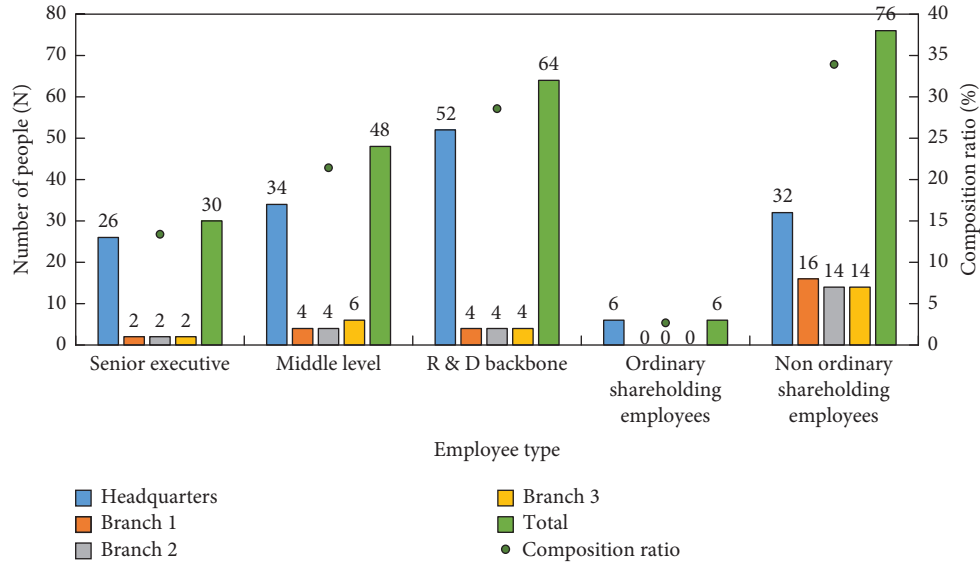


FIGURE 1: Employee stock ownership structure of company D.

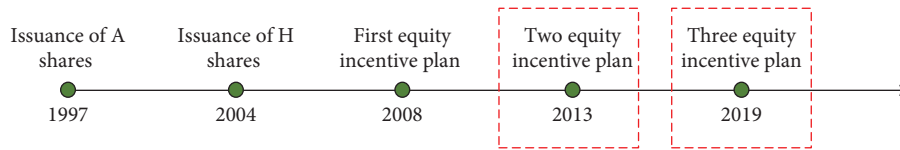


FIGURE 2: Implementation diagram of equity incentive plan of company D.

3.2. Performance Evaluation. In order to evaluate the effect of the employee equity incentive plan of listed companies, this paper evaluates the company's performance through two combination weight methods: in this method, the entropy weight method is used to obtain the weight obtained by the modified analytic hierarchy process so as to obtain the accurate and reasonable combination weight [21]. Quantitative and qualitative evaluation method, which is widely used in the overall goal, is affected by multiple factors. Analytic hierarchy process model includes hierarchical structure model, construction of judgment matrix, calculation of relative weight, and consistency test. The consistency of judgment matrix needs to meet the judge's judgment of language consistency and scale and language consistency. Assuming that $s(i, j)$ represents two factor weights, $p(i)$ and $p(j)$, compare the evaluation scale; the following equation can be obtained in the judgment matrix.

$$s(i, j) = \frac{p(i)}{p(j)}. \quad (1)$$

In equation (1), the weight comparison detection scale can be obtained by means of psychological test and language scale.

$$s(i, j) = \frac{s(i, t)}{s(i, t)}. \quad (2)$$

In equation (2), scale is a criterion of consistency judgment, which is the reasoning language of consistency. The consistency index is usually given by experimental experience, as shown in Figure 5.

Suppose $t(k)$ is the corresponding scale of the k level language. If $p(i) \geq p(j)$ and $s(i, j) = t(k)$, the difference between the relative weight values of the two things to be evaluated can be expressed by the following formula.

$$\Delta k = \frac{p(i) - p(j)}{(p(i) + p(j))/2} = 2 \frac{t(k) - 1}{t(k) - 1}. \quad (3)$$

According to formula (3), there is a certain relationship between the values of $t(k)$, Δk , and k . According to formula (3), their relationship can be further simplified.

$$t(k) = \frac{2 + \Delta k}{2 - \Delta k}. \quad (4)$$

In formula (4), the values of $t(k)$ and $t(k)$ will also increase gradually. Therefore, the evaluation result of things is closely related to the change of k . In view of the problems of the most widely used 1–9 scale system, the improved 9/9–9/1 scale is studied. Let k change continuously and satisfy

$$\frac{d_2 \Delta(k)}{ak^2} = \text{Constant value}. \quad (5)$$

Continuous language evaluation level x shall meet

$$\Delta(x) = \frac{2}{3} \Delta(4) + \frac{1}{3} \Delta(5). \quad (6)$$

The approximate calculation formula of the scale is

$$\frac{s(k)}{(10 - k)}. \quad (7)$$

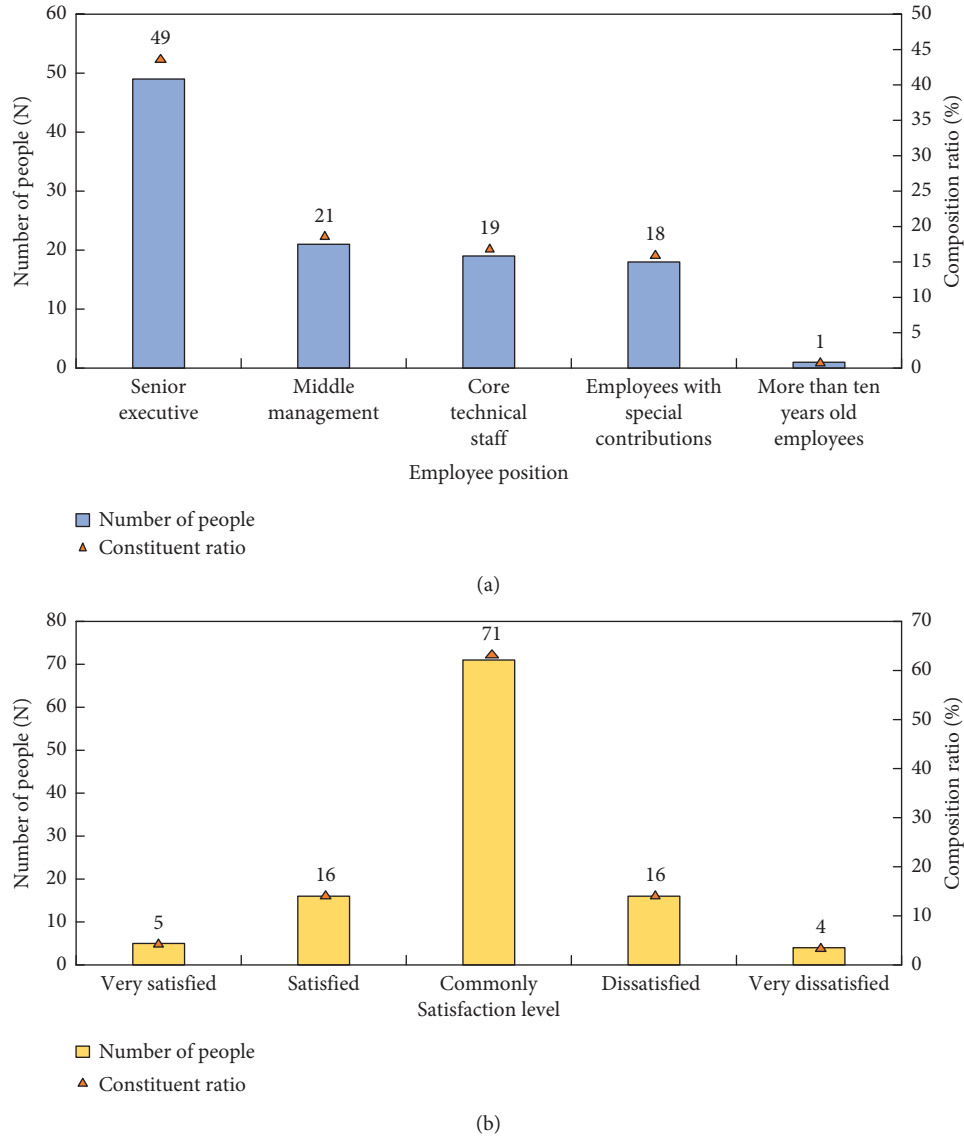


FIGURE 3: Statistics of equity incentive employees in D company at different development stages and survey results of employees' satisfaction with salary in company D. (a) Statistics of equity incentive employees in D company at different development stages. (b) Survey results of employees' satisfaction with salary in company D.

For each pairwise comparison matrix, first calculate the maximum eigenvalue and the corresponding eigenvector, and then detect the consistency through three methods.

$$e_i = -k \sum_{j=1}^n (p_{ij} \ln p_{ij}). \quad (8)$$

In equation (8), $k = \ln 1/n$. The difference coefficient of each index is $1 - e_i$. The entropy weight i of index i is calculated through $d_i / \sum_{i=1}^m d_i$. Due to the advantages of the two algorithms, the combination weight is obtained through linear combination, and its calculation expression is

$$W = \alpha w_i^a + (1 - \alpha) w_i^s. \quad (9)$$

In equation (9), w_i^a and w_i^s represent the weights obtained by analytic hierarchy process and entropy weight method, respectively. In order to avoid the large square

deviation between them in the actual process, set the value of α to 0.5. Because the evaluation of the company's financial risk is a multi-index evaluation, specifically including five financial indicators: cash flow, growth ability, operating ability, solvency, and profitability. At the same time, the indicators include negative indicators, appropriate indicators, and positive indicators. In the research process, to prevent the interference of different index magnitude and dimension on the evaluation results, ΔR and T_C evaluation indexes are used for dimensionless quantification. Two basic variables are involved in multi-index comprehensive evaluation: one is the actual value of each evaluation index, and the other is the evaluation value of each index. Because the physical meaning of each index is different, there are dimensional differences. This dimensionality is the main factor affecting the overall evaluation of things. The dimensionless treatment of indicators is the main means to solve this

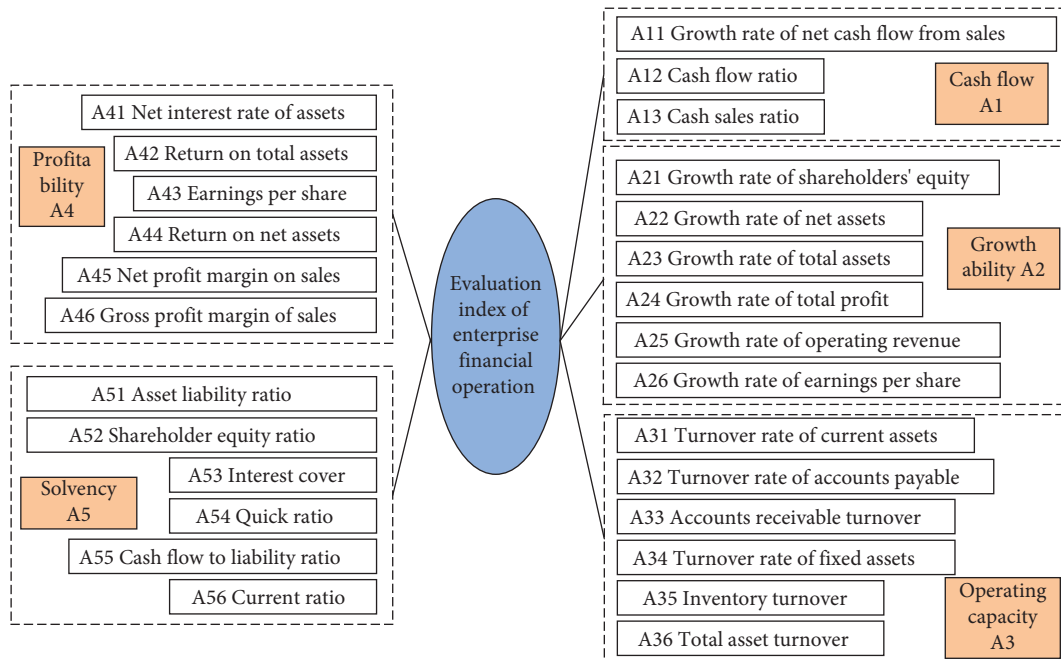


FIGURE 4: Evaluation indicators of enterprise financial operation.

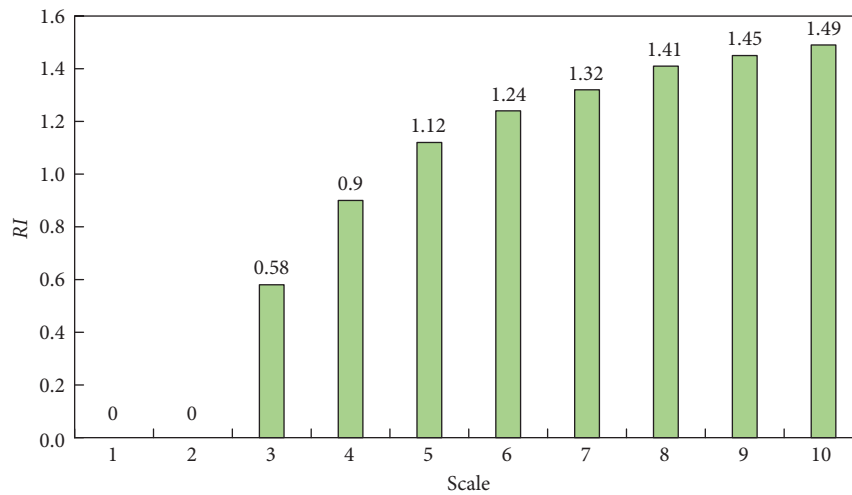


FIGURE 5: Specific conditions of random consistency index.

problem. Dimensionless, also known as data standardization and normalization, is a method to eliminate the dimensional influence of original variables through mathematical transformation.

$$r_j(x) = \frac{1}{2} + \frac{1}{2} \sin \left[\frac{\pi}{x_{j\max} - x_{j\min}} \left(x_j - \frac{x_{j\max} + x_{j\min}}{2} \right) \right]. \tag{10}$$

And the dimensionless quantized value $x_j(x) = 0$ of the j index.

$$r_j(x) = \frac{1}{2} - \frac{1}{2} \sin \left[\frac{\pi}{x_{j\max} - x_{j\min}} \left(x_j - \frac{x_{j\max} + x_{j\min}}{2} \right) \right]. \tag{11}$$

The evaluation index rating includes five grades: very high, high, average, low, and very low. The specific quantitative values are 8–10, 6–8, 4–6, 2–4, and 0–2, respectively. According to the grade of evaluation index, the evaluation ash and whitening weight function are determined. The evaluation ash is also divided into five levels ($b = 1, 2, 3, 4, 5$), corresponding to high, high, general, low, and low marketing effects, respectively. The study adopts the ten-point system of five paragraphs to complete the score. When $b = 1$, $\otimes_1 \notin [0, 1, 2]$, the calculation formula of whitening weight function $g_1(p_{ijb})$ is shown in the following formula.

$$g_1(p_{ijb}) = \begin{cases} 1 & p_{ijb} \in [0, 1] \\ (2 - p_{ijk})/2 & p_{ijb} \in [1, 2], \\ 0 & p_{ijb} \in [2, 3]. \end{cases} \tag{12}$$

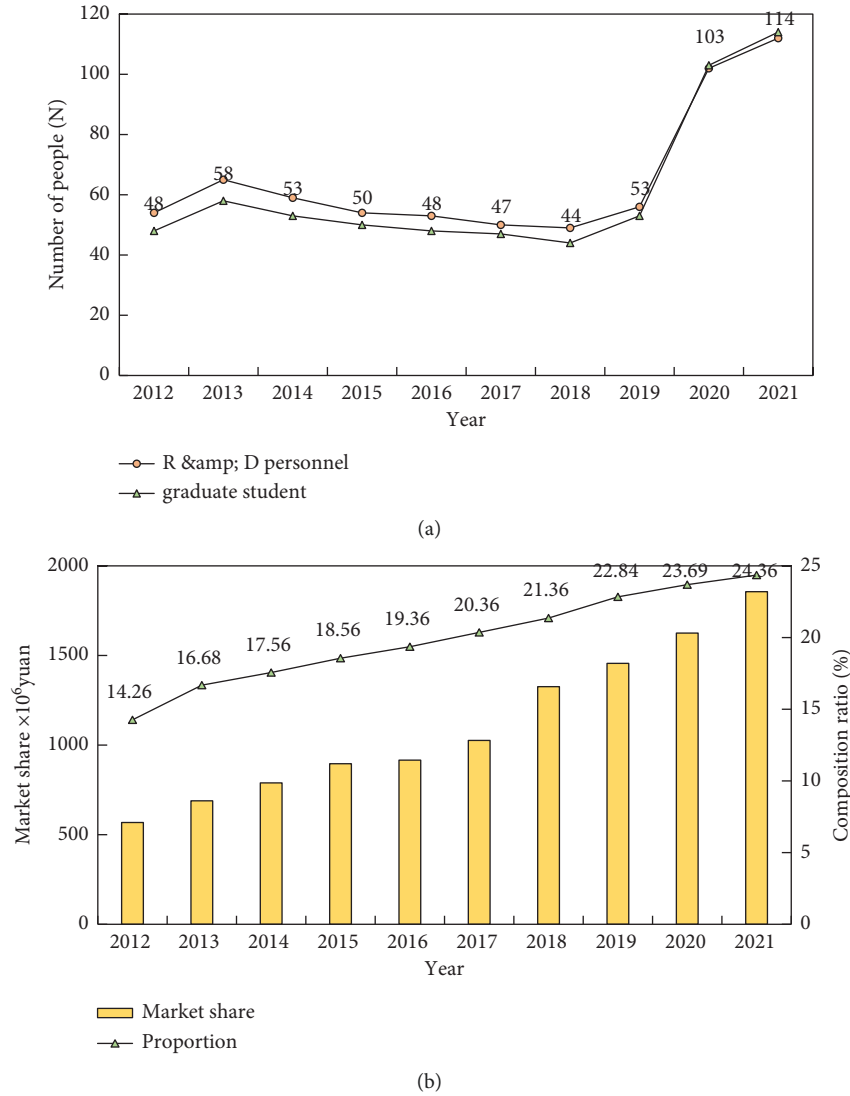


FIGURE 6: Impact on market share before and after the implementation of the plan. (a) Results of learning and growth dimensions before and after the implementation of the third phase equity incentive plan. (b) Impact on market share before and after the implementation of phase III equity incentive plan.

Similarly, the whitening weight function corresponding to different evaluation grey levels can be obtained. To evaluate the company's financial risk, it is necessary to determine the grey evaluation matrix D_m . Firstly, the whitening weight of the company's financial risk evaluation index is obtained; then, the grey evaluation coefficient of each index is obtained according to the whitening weight, and finally the grey evaluation matrix is obtained according to the grey evaluation weight. When calculating the grey evaluation weight vector and weight matrix, the total grey evaluation number of each grey category of evaluation index D_{mp} is represented by d_{mp} , and d_{mpe} represents the grey evaluation weight of the b evaluation grey category of evaluation index D_{mp} . The grey evaluation weight matrix is

$$D_m = (d_{m1}, d_{m2}, \dots, d_{mP_n})^T = \begin{bmatrix} d_{m11} & d_{m12} & d_{m13} & d_{m14} \\ d_{m21} & d_{m22} & d_{m23} & d_{m24} \\ \vdots & \vdots & \vdots & \vdots \\ d_{mP_n1} & d_{mP_n2} & d_{mP_n3} & d_{mP_n4} \end{bmatrix} \quad (13)$$

In order to intuitively reflect the company's financial risk, the single valued grey comprehensive evaluation matrix is studied, and the transposed product of the grey comprehensive evaluation matrix and the grade valued vector of each evaluation grey class is taken as the grey comprehensive evaluation value. Finally, multilevel grey comprehensive

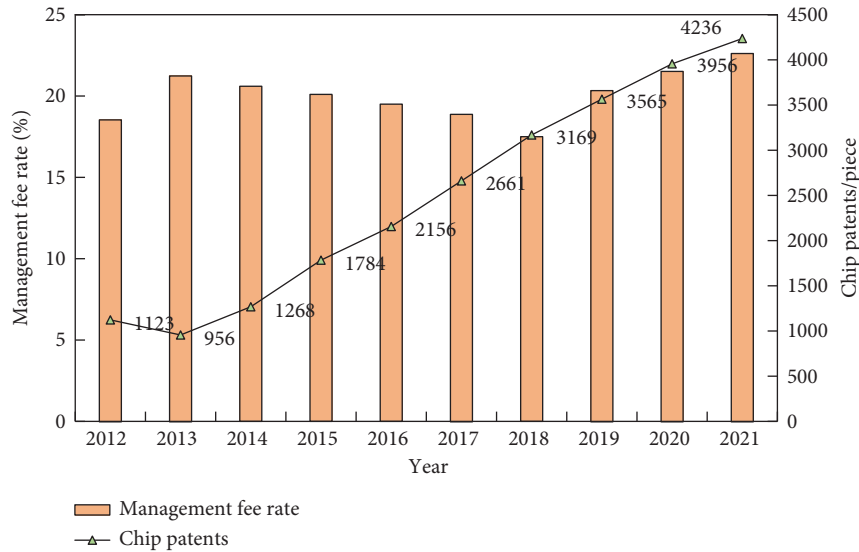


FIGURE 7: The impact on the internal business process dimension before and after the implementation of the third phase equity incentive plan.

evaluation is carried out for the first-level indicators. B_m the calculation expression of grey comprehensive evaluation result is the following formula.

$$B_m = W_m \circ D_m. \tag{14}$$

The final comprehensive evaluation result of the financial risk of the listed company is as follows.

$$B = W \circ (B_1, B_2, B_3, B_4, B_5)^T = (b_1, b_2, b_3, b_4). \tag{15}$$

4. Application of Equity Incentive in Performance Management of Employees in Listed Companies

4.1. Analysis of Nonfinancial Indicators in Performance Management. Figure 6(a) shows the impact on learning and growth dimensions before and after the implementation of the equity incentive plan. It can be seen that after the implementation of the equity incentive plan, the overall number of researchers and postgraduates of the company has been significantly increased, but it began to decline in 2014, which is mainly due to the downsizing of the company in 2014. After the implementation of the plan, the number of graduate students has increased greatly. Therefore, the third equity incentive plan helps to improve the company's growth and learning ability. Figure 6(b) refers to the impact on market share before and after the implementation of the phase III equity incentive plan. In 2013, China Mobile won the bid for the 4th generation mobile communication technology (4G), and company D gradually has a higher market share. In 2017, after company D began to invest in consumer business, government and enterprise business, operators, and other fields, the overseas market share gradually increased. In 2019, the communication technology was transformed into the 5th generation mobile communication technology (5g), and the

domestic and foreign market share of company D was further improved.

Figure 7 shows the impact on the internal business process dimension, and the impact of specific management expenses and technology R&D. The management expense rate continued to decline from 2013 to 2015, which shows that the company's operating efficiency and management have been greatly improved. The company's management expense rate shows a gradual upward trend, which is mainly caused by the increase of amortization and other expenses of company D in 2020 and the decrease of operating income. Enterprise D won the champion of international patent applications in 2016 and 2020. At present, there are more than 4200 chip patent applications.

4.2. Analysis of Financial Indicators in Performance Management. According to the calculation formula of portfolio weight, the index weights of five categories of financial indicators: cash flow, development capacity, operating capacity, profitability, and solvency are 0.123, 0.227, 0.213, 0.231, and 0.204, respectively. See Figure 8 for details. Among the primary indicators of solvency, A51 secondary indicators account for the highest proportion. Among the primary indicators of cash flow, A12 secondary indicators account for the highest proportion. Among the primary indicators of development capacity, A24 secondary indicators account for the highest proportion. Among the primary indicators of operating capacity, A32 secondary indicators account for the highest proportion. Among the primary indicators of profitability, A43 secondary indicators account for the highest proportion.

Through the grey comprehensive evaluation method, the evaluation values of five first-class indicators of enterprise D are obtained, as shown in Figure 9. Before the implementation of equity incentive method, the evaluation value range of $d1-d5$ primary indicators is 6–8 points. After the

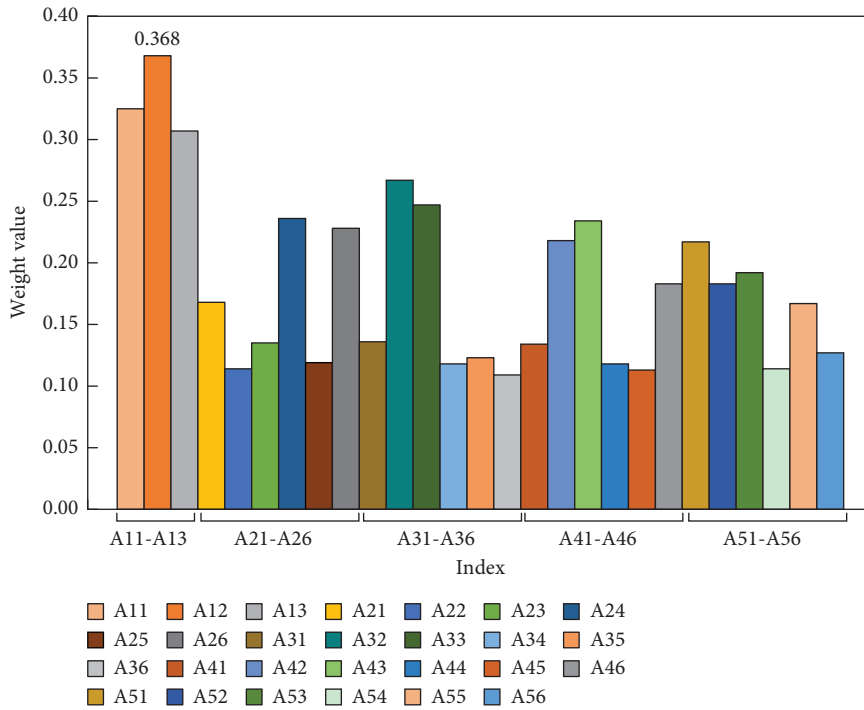


FIGURE 8: D specific weight values of various types of indicators of the enterprise.

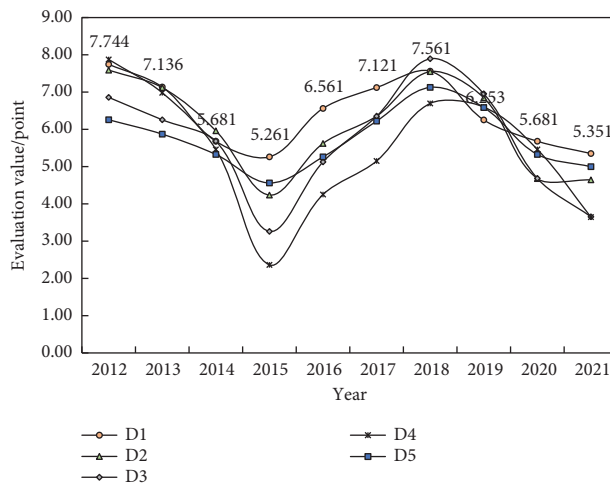


FIGURE 9: Evaluation values of five primary indicators of D enterprise.

equity incentive method is implemented, the evaluation value range of $d1-d5$ primary indicators is 2–6 points. Therefore, this shows that the above five evaluation indicators can well analyze the financial situation of enterprise D. According to the in-depth analysis, the influence degree of the evaluation value of the five primary indicators from small to large is cash flow, profitability, development ability, operation ability, and solvency. Therefore, when formulating equity incentive methods for employees, D enterprise needs to carry out from the aspects of enterprise profit risk and debt repayment risk and build a perfect financial risk early warning and evaluation system so as to evaluate the financial

performance of the enterprise in real time. In addition, enterprises also need to continuously optimize the internal control system, improve the reasonable and all-round financial decision-making mechanism, build a scientific and reasonable risk prevention mechanism, and establish a positive attitude to correctly face financial risks.

5. Conclusion

At present, whether the equity incentive method of listed companies has significant value to employees, customers, and the company still needs to be verified. Taking D listed

company as an example, this paper analyzes the effect of equity incentive method on enterprise performance management under the balanced scorecard theory and evaluates the financial risk before and after the implementation of equity incentive method through an enterprise financial risk evaluation system. The results show that the number of researchers, graduate students, and market share of the company have been significantly improved. The management expense ratio continued to decline from 2013 to 2015, but after the implementation of the third phase of equity incentive plan in 2019, the company's management expense ratio showed a gradual upward trend. The number of chip patent applications has increased year by year, and the number of chip patent applications in 2020 has reached more than 4200. According to the combination weight calculation, the index weights of cash flow, development ability, operating ability, profitability, and solvency are 0.123, 0.227, 0.213, 0.231, and 0.204, respectively. Before the implementation of equity incentive method, $d1-d5$ primary indicators have high risks. After the implementation of equity incentive method, the risk value of $d1-d5$ primary indicators decreased significantly. Limited by my time and energy, the enterprise financial risk evaluation system constructed by the research institute is only applicable to high-tech enterprises, and the balanced scorecard analysis used needs to establish a financial risk system suitable for various types of enterprises.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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