A reasonable enterprise performance evaluation system not only is conducive to the scientific nature of enterprise internal management, but also can accurately reflect the shortcomings in development and provide effective guidance for the high-quality and efficient development of enterprises. Therefore, based on the relevant theories and research of performance evaluation and balanced scorecard (BSC), this paper analyzes the shortcomings of the current performance evaluation system of enterprises and the necessity and feasibility of applying BSC to design performance evaluation system. Then, we design a performance evaluation system with the characteristics of listed companies (LC). Finally, we use the analytic hierarchy process (AHP) to conduct a comprehensive performance evaluation of enterprise A and propose corresponding safeguards for the smooth implementation of the system according to the evaluation results.

1. Introduction

As an important part of nonpublic economy, LC play a positive role in economic development and are the subject of numerous scholars [1]. Enterprise performance evaluation is an analysis method to study the current situation and sustainable development capacity of enterprises, which has a guiding role in internal self-examination and the formulation of further development strategies of enterprises [2]. Enterprise performance evaluation methods are constantly developing and changing, and their application effects may vary depending on the specific research methods used. Therefore, an appropriate method to evaluate LC has a significant impact on reflecting the real performance level of enterprises [3]. However, there are some problems in the performance evaluation system of LC. On the one hand, the types of performance indicators are single and one-sided [4]. At present, the performance evaluation system of LC is mainly based on various financial indicators, reflecting the profitability, solvency, asset status, and operating growth status of enterprises. For the factors that affect the development of enterprises, such as customer opinions, internal process efficiency, employees’ learning and growth potential, and industrial policy requirements, enterprises are not included in the scope of performance evaluation. Although such a performance evaluation method is simple and convenient enough, the financial data reflect more of the enterprise’s past operating conditions, leading to the enterprise to ignore the ability of sustainable development to a certain extent [5]. On the other hand, corporate management’s participation in performance management is not enough [6]. Although the management participates in the formulation of the annual target of the enterprise, the follow-up work is mainly carried out by the human resources department, which mainly focuses on the supervision and evaluation of performance, and the evaluation results are only used as the basis for salary payment [7]. The lack of communication and feedback between management and employees leads to low enthusiasm of employees. The important purpose of performance evaluation is to improve the work enthusiasm of all employees and then improve the operation and production efficiency of enterprises, and the realization of these goals depends on the active participation of all employees [8]. Therefore, enterprises should help employees find the relationship between performance appraisal and their own career planning, so that employees’ goals are clearer and
strive to keep consistent with the development direction of the enterprise [9].

Currently, commonly used performance evaluation methods include Management by Objectives (MBO), Key Performance Indicator Assessment (KPI), Economic Value Added (EVA), and Balanced Scorecard (BSC) [10–13]. Among them, as a performance management tool with strategy as the core, BSC has many advantages and has been widely used in performance evaluation [14]. The evaluation dimensions of BSC are mainly divided into four dimensions, that is, financial, customers, internal processes, and learning and growth, which represent the interests of the shareholders, customers, employees, etc. The important degree of each dimension depends on the content of index to the importance of the strategic objectives of the enterprise, namely, the size of the index weight. The dimensions of BSC are linked to each other and have certain causal relationship between each other [15]. The core content of each dimension is shown in Figure 1. Therefore, it is necessary for LC to introduce BSC to construct performance evaluation index system. Firstly, it helps improve the enterprise performance evaluation system [16]. The current performance evaluation of enterprises is mainly based on financial indicators, but the factors that affect enterprise performance come from all aspects, which leads to the performance of some functional departments that cannot be properly evaluated. The application of BSC can make managers pay attention to other aspects besides financial indicators, which can significantly improve the efficiency of enterprise operation and management. Secondly, it contributes to the realization of corporate strategic goals [17]. Although the enterprise has clear strategic goals and corporate vision, the strategic planning of the enterprise is not detailed and implemented and cannot be integrated with the specific work and actions of ordinary employees. BSC is not only a scientific method of strategic performance evaluation, but also an effective performance management tool [18]. It can decompose strategic objectives and refine them into specific performance evaluation indicators, which is conducive to strengthening strategic implementation and monitoring strategic objectives of enterprises. In addition, it helps stimulate employees’ work enthusiasm [19]. The current performance evaluation system of LC does not solicit opinions and suggestions from employees in the process of formulation and implementation. If there is no effective communication and feedback link between managers and employees, performance evaluation will not accurately reflect the actual needs of employees, thus reducing the enthusiasm of employees to participate [20]. BSC can connect all departments and employees at all levels of an enterprise through the layered decomposition of strategic objectives, so as to improve employees’ understanding of the enterprise’s business planning and strategic objectives [21].

Based on BSC, this paper studies the performance evaluation of LC. Combined with the production and operation characteristics of LC and related industry policies, a new performance evaluation system is designed from the four dimensions of finance, customers, internal processes, and learning and growth. It can not only help improve the business performance management of LC and promote the early realization of strategic objectives, but also provide reference for the construction of enterprise performance evaluation system.

2. Related Work

Some scholars have used different methods to study the performance of LC, including operating performance, financial performance, and comprehensive performance. For example, Li et al. [22] used DEA model to study the operating efficiency of agricultural LC. Different from previous studies, this paper innovatively added two input variables into the analysis of factors that may affect the operating efficiency of agricultural LC, namely, asset impairment loss (AIL) and business tax and surcharge (BTS). Ban et al. [23] studied the performance level of LC by using Fuzzy Analytic Hierarchy Process and TOPSIS method. The index system constructed in this paper had 15 indexes, including 8 financial indexes and 7 nonfinancial indexes. And the results showed that nonfinancial indicators will also have a significant impact on the overall performance of LC. Ban et al. [23] focused on the financial performance evaluation of listed retail enterprises and selected 18 financial indicators and calculated the weight of indicators by standard deviation method (SD). Through empirical analysis, they found that leverage ratio has the most significant impact on listed retail enterprises among these financial indicators. Nguyen et al. [24] introduced BSC in the construction of corporate performance evaluation indicators. The advantage of this approach is that it takes into account not only traditional performance indicators, including financial indicators, quality indicators, and service objectives, but also internal and external process indicators. Then, in order to solve the fuzziness and uncertainty that managers tend to have in the decision-making process, they adopted the grey system theory and combined the decision experiment and evaluation laboratory and network analysis process method to evaluate performance.

3. Performance Evaluation Index System of LC

3.1. Basic Principles and Design Ideas of Index System Construction. In constructing the performance evaluation index system of LC, we follow some basic principles, including objective, systematic, authenticity, and accessibility, so the index system has the characteristics of wide coverage and strong applicability. The details of the indicator building principles are shown in Figure 2.

We use BSC to design the performance evaluation system of LC as shown in Figure 3.

First, we need to clarify the strategic objectives of LC. The strategic goal of the enterprise is the basis of designing the performance evaluation system. We use BSC to design the evaluation index system, which is always oriented by the enterprise strategy, and then combine the enterprise strategy with the short-term goal of the individual and transform the organizational strategy into measurable indicators, so as to promote the effective implementation of the strategy. Then, we
determine the performance evaluation index from the four dimensions of BSC and combined with the actual situation of enterprises. Finally, the weight of indicators is determined. This paper adopts AHP to determine the weight of indicators at all levels. So far, BSC performance evaluation index system of LC has been designed, but it should be noted that the system needs to be revised and improved according to the development and change of internal and external environment.

3.2. Construction of Performance Evaluation Index System of LC. At the level of organizational and personal performance, performance management can effectively promote the simultaneous development of enterprises, departments, and employees. On the one hand, the management can communicate effectively with the working layer and provide some guidance. On the other hand, employees further enhance themselves according to these guidance and information resources. Therefore, when constructing the performance evaluation index system of LC, we choose BSC to consider the factors affecting the performance of LC, including finance, customers, internal processes, and learning and growth. There are four first-level indicators and 24 second-level indicators in the final performance evaluation index system of LC, as shown in Figure 4.

Among them, the specific explanation of financial indicators is as follows:

- **Growth rate of business income and growth rate of total assets** reflect the growth ability of LC. The higher the former represents the faster revenue growth of LC, the better the market prospects are. The latter reflects the expansion speed of enterprise capital scale, and it is an important indicator to measure the change and growth of enterprise total scale.
- **Return on net assets** reflects the profitability of LC. It can reflect the earnings level of shareholders' equity to measure the efficiency of companies using their own capital. The higher the index value, the higher the return on investment.
- **Speed ratio and asset-liability ratio** reflect the solvency of LC. The former measures the ability of LC to immediately cash in their current assets to repay current liabilities. The
latter refers to the percentage of total liabilities divided by total assets. It measures the ability of LC to raise debt and reflects the risk of creditors lending.

Total asset turnover rate reflects the operational capacity of LC. It is a comprehensive index to investigate the operational efficiency of enterprise assets, which reflects the transfer speed, management quality, and utilization efficiency of all assets from input to output.

4. Performance Evaluation of LC

4.1. Method Selection. It is an important step for determining the weight of performance evaluation index in designing BSC evaluation system. Because the balance of the relationship between the various levels of indicators will directly affect the effectiveness of the dimension objectives, scientific and reasonable index weight setting can make all the inspection contents clearly reflect the specific situation of enterprise finance, customers, internal operation, and growth and learning. This paper uses AHP to calculate the weight of each index. Our basic idea is to divide the problem to be analyzed and then decompose the problem layer by layer according to the nature of the problem and the overall goal to be achieved. Finally, the problem is decomposed into different components, and the hierarchical structure model is formed according to the relationship between the elements, so as to determine the weight value of each element [25, 26].

4.2. Determination of Performance Evaluation Index Weight of LC

4.2.1. Build Hierarchical Structure Model. According to the performance evaluation index system of LC, this paper divides the hierarchical structure model from top to bottom.
into three levels, namely, the target layer, the criterion layer, and the scheme layer, and each layer of indicators is a gradual decomposition of the upper layer of indicators. Specifically, we take the strategic objectives to be achieved by LC as the target layer, then the key factors corresponding to the four dimensions as the criterion layer, and the specific indicators under each dimension as the scheme layer. The hierarchical structure model is shown in Figure 5.

4.2.2. Construct Judgment Matrix. According to the research requirements of comprehensive analysis and performance evaluation of LC, this paper invited 10 experts to carry out the index weight calculation of performance evaluation of LC. The panel members we invited include managers of LC and managers of various departments. Then, according to the established performance evaluation index system of LC and combined with their own theory and practical experience, the expert group constructs a criterion layer judgment matrix and four index layer judgment matrices. Special attention is paid by the experts to the 1–5 scale method for the importance of each index pairwise comparison and scoring. We summarize the results of expert scoring and construct the corresponding judgment matrix. The scoring criteria of 1–5 scale method are shown in Figure 6.

$$\begin{bmatrix}
a_{11} & a_{12} & \cdots & a_{1n} \\
a_{21} & a_{22} & \cdots & a_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
a_{n1} & a_{n2} & \cdots & a_{nn}
\end{bmatrix}$$

$$a_{ij} = \frac{a_i}{a_j}$$
where $A$ is the judgment matrix. $a_i$ and $a_j$ represent the elements in the hierarchy. $a_{ij}$ represents the relative importance of the right.

4.2.3. Index Weight Calculation and Consistency Test. After discussing the establishment of multiple judgment matrices in the criterion layer and the indicator layer by the expert group, we also need to perform the consistency test of judgment matrices. The calculation formula and test standard of consistency test are shown in Figure 7.

The scoring results of performance, the calculation results of index weight, and the consistency test results by experts are shown in Figures 8 and 9. It can be seen that all the judgment matrices pass the consistency test, indicating that the weight value of performance evaluation index of LC is reasonable. Then, we summarize the above calculation results and finally obtain the weight value of the performance evaluation index of LC, as shown in Table 1.

It can be seen from Table 1 that the weights of financial dimension, customers dimension, internal processes dimension, and learning and growth dimension are 43.19%, 31.27%, 11.50%, and 14.04%, respectively. We find that the financial dimension accounted for the highest proportion of the four dimensions, indicating that LC to improve the operating efficiency and obtain more profits is still the focus of future development. The second is the customer dimension, where customers are the source of corporate profits. In order to obtain more profits, LC must pay attention to the acquisition and maintenance of customers and improve customer satisfaction. Internal process dimension and learning and growth dimension are relatively small, but cannot be ignored. Efficient internal operation is the embodiment of the competitive advantage of enterprises, and the learning and growth of enterprise employees provide human resources support for the long-term development of enterprises, while enhancing enterprise cohesion. In the scheme layer, the comprehensive weights of growth rate of business income and return on net assets accounted for the highest proportion, which are 13.9% and 12.5%, respectively. However, the combined weights of input rate of research and development expenditure and input-output ratio are relatively low, 0.5% and 0.8%, respectively. Return on net assets and growth rate of business income account for a large proportion, which is consistent with the goal of maximizing enterprise value. Input rate of research and development expenditure and input-output ratio relatively reflect the internal operating efficiency of enterprises. Although the proportion is relatively small, it cannot be ignored.
4.3. Performance Comprehensive Evaluation of LC. Taking enterprise A as an example, this paper uses the index weight value calculated above to conduct a comprehensive performance evaluation. The specific calculation process is as follows:

4.3.1. Determine the Target Value. In the performance evaluation work, enterprises should be clear to achieve the performance target value as the motivation to enhance performance and judge whether to achieve the target standard. Common performance evaluation criteria include historical value, enterprise target value, and industry average standard. In order to reflect the long-term strategy, the financial data indicators in this paper are based on the development of enterprises in the past three years and are adjusted according to the strategic objectives of enterprises. Other indicators are based on the target value of enterprises.

4.3.2. Determine Scoring Standards. In order to clarify the score of each indicator, this paper first divides the specific performance evaluation level and then uses equations (2)–(5) to calculate the comprehensive evaluation results of enterprise A. The level of performance evaluation is shown in Table 2.

\[
P = C_1 \times W_1 + C_2 \times W_2 + \cdots + C_{24} \times W_{24},
\]

\[
C_n = R \times 100.
\]

Among them, \(P\) is the final score of enterprise A performance comprehensive evaluation. \(C\) is the score of each index of enterprise A. \(W\) is the comprehensive weight of each index. \(R\) is the relationship ratio. The calculation method of relationship ratio is divided into two cases. Assuming the target value is \(TV\), and the actual value is \(AV\), when the index is positive, the relationship ratio is calculated by formula (4). When the index is negative, the relationship ratio is calculated by formula (5).

\[
R = \frac{AV}{TV} \times 100\%.
\]

\[
R = \frac{TV - (AV - TV)}{TV} \times 100\%.
\]
customer satisfaction and employee satisfaction, we use questionnaires to obtain data. By summarizing the scores of each performance evaluation index, we can get the overall performance results of enterprise A, as shown in Table 3.

4.4. Analysis on Comprehensive Evaluation Results. According to the calculation, the total performance evaluation score of enterprise A in 2021 is 107.52. We compare the calculation results with the performance evaluation standard value of LC in Table 2 and find that the enterprise reaches the excellent standard. Overall, enterprise A has a good performance. The following is a detailed analysis from various dimensions. Firstly, from the financial dimension, the total score of performance evaluation is 58.41, which contributes nearly half of the total score. On the one hand, the weight of the financial dimension index is relatively large; on the other hand, it also shows that the financial situation of enterprise A in 2021 is very good. Among them, the growth rate of business income, return on net assets, and growth rate of total assets exceeded the target value and contributed additional scores to the financial dimension. Secondly, from the perspective of customers dimension, the total score of performance evaluation is 27.63, in which market share, customer acquisition rate, and satisfaction have achieved good results. On the one hand, it shows that the customers of enterprise A are satisfied with the products and services of the enterprise; on the other hand, it also benefits from the better market development. However, the propaganda expenses proportion did not reach the target value, indicating that enterprise A needs to enhance the attention of product publicity. Thirdly, from the perspective of internal processes, the total score of performance evaluation is 9.27, among which the index of production plan completion rate contributes a lot. This is mainly due to the fact that enterprise A grasps the development opportunities of the industry, and the sales revenue of the enterprise increases significantly, which promotes the improvement of personal performance of employees. In addition, the input rate of research and development expenditure of enterprise A have also increased but remain to be improved. Finally, from the perspective of learning and growth, the total score of performance evaluation is 12.21. There is a certain gap between the actual value of this dimension and the target value of the enterprise,

Table 1: Index weight of performance evaluation of listed companies.

<table>
<thead>
<tr>
<th>Criterion layer</th>
<th>Weight</th>
<th>Schematic layer</th>
<th>Weight</th>
<th>Total weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>0.471</td>
<td>C1</td>
<td>0.295</td>
<td>0.139</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C2</td>
<td>0.125</td>
<td>0.059</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C3</td>
<td>0.266</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C4</td>
<td>0.177</td>
<td>0.083</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C5</td>
<td>0.065</td>
<td>0.030</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C6</td>
<td>0.072</td>
<td>0.034</td>
</tr>
<tr>
<td>B2</td>
<td>0.278</td>
<td>C7</td>
<td>0.304</td>
<td>0.085</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C8</td>
<td>0.117</td>
<td>0.033</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C9</td>
<td>0.257</td>
<td>0.071</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C10</td>
<td>0.190</td>
<td>0.053</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C11</td>
<td>0.062</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C12</td>
<td>0.070</td>
<td>0.019</td>
</tr>
<tr>
<td>B3</td>
<td>0.087</td>
<td>C13</td>
<td>0.191</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C14</td>
<td>0.092</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C15</td>
<td>0.059</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C16</td>
<td>0.127</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C17</td>
<td>0.321</td>
<td>0.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C18</td>
<td>0.211</td>
<td>0.018</td>
</tr>
<tr>
<td>B4</td>
<td>0.164</td>
<td>C19</td>
<td>0.069</td>
<td>0.011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C20</td>
<td>0.064</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C21</td>
<td>0.329</td>
<td>0.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C22</td>
<td>0.174</td>
<td>0.029</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C23</td>
<td>0.242</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C24</td>
<td>0.123</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Table 2: Performance evaluation scale of LC.

<table>
<thead>
<tr>
<th>Number</th>
<th>Score P</th>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P ≥ 90</td>
<td>Excellent</td>
<td>Performance is very good and even better than expected</td>
</tr>
<tr>
<td>2</td>
<td>80 ≤ P &lt; 90</td>
<td>Good</td>
<td>Basically achieving enterprise goals</td>
</tr>
<tr>
<td>3</td>
<td>70 ≤ P &lt; 80</td>
<td>General</td>
<td>General performance and larger room for improvement</td>
</tr>
<tr>
<td>4</td>
<td>60 ≤ P &lt; 70</td>
<td>Qualified</td>
<td>Qualified performance and need to be improved in time</td>
</tr>
<tr>
<td>5</td>
<td>P &lt; 60</td>
<td>Unqualified</td>
<td>Poor performance and difficult to improve</td>
</tr>
</tbody>
</table>
especially the growth rate of research and development expenditure and employee growth rate. So, enterprises need to pay attention to the real needs of employees and further improve the salary system and incentive mechanism.

4.5. Guarantee Measures for Implementing Performance Evaluation System with BSC

4.5.1. Establish and Improve the Organizational Responsibility Mechanism. Enterprises should establish a scientific and effective organizational responsibility mechanism to ensure the effective implementation of BSC performance appraisal system. Firstly, enterprises need to set up special performance evaluation groups. It can be by high-level enterprises as team leader and grasp the overall direction of performance evaluation and timely solve the problems encountered in the implementation process of performance evaluation. Secondly, enterprises also need to establish standardized business operation processes. It is conducive to simplifying the complex and cumbersome work of enterprises, thereby improving work efficiency and optimizing internal management level. Finally, enterprises allocate rights and responsibilities to make employees aware of their rights and obligations by clarifying the responsibilities of various departments and employees.

4.5.2. Improve Employee Awareness and Participation. BSC performance management system decomposes the strategic objectives of enterprises into departments and even individuals, which is a large-scale and difficult project. Therefore, its effective implementation requires the active participation of all employees of enterprises. First of all, the enterprise management should give full play to the leading role. Secondly, the employees of various departments are the main force to create corporate performance and comprehensively improve employees’ understanding of BSC performance evaluation system and their jobs. Only when departments and levels work together and supervise each other can the performance evaluation system be successfully implemented. At present, the employees of company A have limited understanding of BSC, so the management can deepen their understanding by carrying out thematic training or knowledge competition.

4.5.3. Improve the Performance Evaluation Results Application Mechanism. The results of enterprise performance evaluation should be closely combined with the incentive mechanism, such as the application of performance wages and bonuses, job promotion, training and selection, awards, and evaluation of the reference. Only with the real demands of employees being closely integrated can we play the role of performance evaluation, so as to fully mobilize the enthusiasm of employees. At the same time, enterprises should timely open and transparently feed back the results of performance evaluation to help employees find shortcomings and improve them. In addition, leaders should also strengthen the daily communication with subordinate staff, pay attention to the needs and ideas of subordinate staff, understand their working status and progress, and listen carefully to the opinions and suggestions of staff, so as to improve the problems existing in the performance evaluation in time.
5. Conclusions

Through the research on the current performance evaluation system of LC, this paper finds that there are some problems in the current performance evaluation methods. After consulting a large number of literature, we have developed a new performance evaluation system for enterprise A with BSC as a tool and put forward some corresponding safeguards. We hope that the new performance evaluation system can provide support for the future development of LC and improve their market competitiveness. The research conclusions of this paper are as follows:

Firstly, by analyzing the current performance evaluation methods of LC and combining with their strategic objectives, we refine the company’s strategic objectives to 24 indicators from four dimensions and then use BSC method to establish a performance evaluation system for LC.

Secondly, we construct a comprehensive performance evaluation model of enterprise A, and the final evaluation score is 107.52, indicating that the performance of enterprise A is good.

Thirdly, in order to make BSC better implemented in enterprise A, we put forward the relevant guarantee measures; namely, establish and improve the organizational responsibility mechanism, improve employee awareness and participation, and improve the performance evaluation results application mechanism.

In this paper, the design of the performance evaluation system for enterprise A is only for the enterprise level, and the performance evaluation system at the department and individual levels has not been studied in depth. There is still a large research space, and it is expected that further research can be carried out in the future. In addition, the method of determining the weight of evaluation index in this paper is mainly the expert scoring method. Although the opinions of industry personnel and experts are consulted, it is subjective to some extent. How to improve the accuracy and objectivity of the weight of performance evaluation index and ensure the scientific and effective performance evaluation index system to the maximum extent still needs further research [27].

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 or personal relationships that could have appeared to influence the work reported in this paper.

References


balanced scorecard approach built on mackenzie king’s model of an industrial relations system,” Relations Industrielles/Industrial Relations, vol. 73, no. 4, pp. 664–701, 2019.


