

Empirical Study On Corporate Governance Evaluation of Listed Companies in Gas Industry

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Abstract

As a public welfare enterprise, China's gas industry is invested and built by the government, monopoly operation has become the norm, and improving the corporate governance structure has become the most urgent thing. This article will use the corporate governance evaluation index system of gas industry empirical research on the corporate governance of listed companies, through the shareholding structure, managers, managers, information disclosure, and financial performance in five aspects of the eleven specific indicators, has carried on the factor analysis to gas industry sample data, samples and it is concluded that the corporate governance efficiency analysis of the comprehensive score and ranking. Summed up the governance characteristics of companies with low governance efficiency. Finally, the paper puts forward some Suggestions on how to improve the governance efficiency of listed companies in China.

Keywords

Gas industry, Corporate governance evaluation, factor analysis.

1. Introduction

In China, the gas industry has always been invested and built by the government as a public welfare enterprise. The government is both an asset owner and a monopoly operator, which integrates regulators and operators. This situation also leads to the formation of a complete monopoly in China's gas industry. The high degree of non-separation between government and enterprises seriously results in unreasonable ownership structure of enterprises, resulting in high cost, low internal labor productivity and poor economic benefits. Therefore, it is urgent to break the monopoly of gas industry, open the market and improve the corporate governance structure. Corporate governance structure, as a kind of management mechanism, its perfect or not will determine the rights related to the company's stakeholders can be protected, if investors in accordance with the company's long-term interests to make business decisions, and the use of funds, the company's daily operations, implement effective monitoring, it can improve the quality of investment, promote the healthy and efficient development of the enterprise. This paper scores and ranks the governance efficiency of listed companies through the factor analysis method, and then analyzes the governance efficiency of listed companies in China according to the empirical research results to find out the reasons for the low governance efficiency of listed companies in China's gas industry.

The method of factor analysis can be represented by mathematical model, it can use a few general situation of multiple variables, most of the information is easy to find out the main factors that can simplify the complex problems, in addition to the solve the problem of information are repeated between indicators, and facilitate explanation was studied for the final empirical results, and then find out the corresponding improvements. Secondly, when determining the comprehensive score of each sample, the weight of each factor is determined according to its factor contribution rate. Compared with other methods to determine the weight, such as expert scoring, the factor analysis method is more objective and scientific.

2. Corporate Governance Evaluation Index Selection.

2.1 Sample Selection.

In this paper, listed companies in the gas industry in 2017 were selected as the research sample, and the listed companies with incomplete information were excluded. Finally, 24 listed companies were obtained as the total sample. The sample data used in the empirical study were all from the national tai 'an database.

2.2 Corporate Governance Indicator Design and Data Processing.

2.2.1 Equity Structure

Ownership structure can have a significant impact on the governance mechanism, which is the basis of corporate governance. According to the actual situation in China, most listed companies in the gas industry in China are state-controlled, and the phenomenon of "one share is dominant" is obvious. The ownership structure is excessively concentrated, and the proportion of outstanding shares is small. Therefore, for the dimension of ownership structure, we choose the following indicators for evaluation:

a. whether the largest shareholder is state-owned. The closer the shareholding of the largest shareholder is to 100%, the smaller the incentive to trigger the "tunnel effect" will be, which will produce a positive effect on corporate governance, but the premise is that the shareholding of the largest shareholder is large enough. However, most of the largest state-owned shareholders of listed companies in China's gas industry will have a negative impact on the efficiency of corporate governance. To sum up, this paper believes that the largest shareholder holding state-owned shares is negatively correlated with the efficiency of corporate governance.

b. degree of equity balance. This indicator refers to the ratio of the number of shares held by the largest shareholder to the number of shares held by the second largest shareholder. The shareholding ratio of the second largest shareholder is the most favorable check and balance factor to control the "tunnel behavior" of the major shareholders, and it is also a favorable supervision for the management. As a result, the smaller the equity balance degree, the second largest shareholder of voice also is heavier, the first big shareholder and management of the binding force is stronger, the more the play the role of supervision, makes it hard for the first big shareholder to make the behavior of the damage the interests of minority shareholders, at the same time enables management to better service for the company, to achieve healthy and sustainable development. In conclusion, this paper holds that the degree of ownership balance is negatively correlated with the efficiency of corporate governance.

c. Equity concentration. Equity concentration refers to the sum of the squared shareholding ratios of the three major shareholders as the evaluation index to reflect the degree of mutual checks and balances among shareholders. The larger the index value is, the higher the degree of equity concentration is, and the smaller the index value is, the more dispersed the equity is. It is believed that decentralized ownership structure can act as a check and balance among shareholders, effectively restrain the bad behaviors of controlling shareholders, and play a significant role in improving the efficiency of corporate governance. To sum up, this paper believes that equity concentration is negatively correlated with corporate governance efficiency.

2.2.2 Board Governance

The responsibility of the board of directors is to make decisions on the operation of the company and supervise the general manager of the company, so as to ensure the normal operation of the company and enable the general manager to serve the interests of all shareholders. It is an important aspect of corporate governance. Whether the normal operation of the board of directors can seriously affect the normal operation of the company's system.

a. Board size.

The ideal scale of the board of directors should enable the board of directors to make reasonable decisions and ensure its efficiency. The board of directors with too large a scale is likely to make it

difficult for the board members to make final decisions due to numerous different opinions, and the communication difficulties among board members will further affect the efficiency of the board of directors. To sum up, this paper believes that the scale of the board of directors is negatively correlated with the efficiency of corporate governance.

b. The proportion of independent directors on the board of directors. Enhance the proportion of independent directors, the board of directors of the listed company members to improve objectivity when making important decisions by the board of directors, the board of directors to stand on a relatively neutral stance on major issues of the listed company's decision-making, reduce support for the interests of managers, internal directors to ensure that the small and medium-sized shareholders get reasonable assurance. At the same time, as independent directors are scholars or experts with high professional skills, their participation helps the board of directors to make more scientific and reasonable decisions and injects fresh power into the board of directors of the company. It can be seen that the increase of the proportion of independent directors is conducive to enhancing the independence of the board of directors and making the decisions of the board of directors more objective. In conclusion, the proportion of independent directors in the board of directors is positively correlated.

2.2.3 Management

Enterprise managers in different social backgrounds and have different management experience, professional knowledge and personal preferences vary, making of its management team has different characteristics, the decisions of the enterprise and the strategic target management also have very big difference, so the influence of different characteristics of the management on the corporate governance efficiency will also exist differences. Therefore, this paper will select two indicators of management size and management age to describe the management dimension.

a. Management size. According to the "high-level echelon theory", high-level background characteristics have different preferences for the system and selection of corporate strategy, thus affecting the efficiency of corporate governance. Managers with different background characteristics form a comprehensive management team, and the size of the team is the integrated factor of individual background. The larger the team, the more ideas you can expand and the more solutions you can get. And the larger the team size, the less likely there is a collective decision-making error. To sum up, this paper believes that there is a positive correlation between executive scale and corporate governance efficiency.

b. Management age. Young people are significantly different from older people in terms of educational background and social environment, and they will take high-risk and high-profit decision-making behaviors at work. Senior citizens, with rich experience and social experience, are generally conservative in strategy formulation and risk behavior. Since the market environment in China is not very mature, decisions with certain social experience are more helpful to the company.

To sum up, this paper believes that older people are conducive to the improvement of corporate governance efficiency.

3. The Empirical Analysis

After processing the sample data, this paper will conduct an empirical study on the sample data with the help of SPSS.20 software.

3.1 Factor Analysis Feasibility Test

Bartlett sphericity test and KMO test will be used in this paper. For Bartlett sphericity test, if the test results show that the significance level is less than 0.05, it indicates that there may be some relationship between the original variables, which is suitable for factor analysis. If the significance level is greater than 0.05, it indicates that the sample data is not suitable for factor analysis. For KMO test, the closer the final test result is to 1, the more public information between sample data, and the more suitable it is for factor analysis. When KMO value is greater than 0.5, factor analysis is

appropriate, while when KOM value is less than 0.5, factor analysis is not appropriate. We first imported the original data into SPSS software for Bartlett sphericity test and KMO test. The output results are as follows:

Table 1 KMO and Bartlett tests

Inspection Methods	The Parameter Value	
KMO sample suitability measure	0.538	
Bartlett Sphericity test	Approximate chi-square	206.898
	Degrees of Freedom	55
	Significant	0.000

From the output results, we can see that gradual chi-square value of 206.898, degrees of freedom is 55, ball type test results show that the correlation coefficient matrix is a unit matrix of the original assumptions, observe the significance level of 0.000, so you should reject the null hypothesis, that the correlation coefficient matrix and there were significant differences between unit matrix, there are simple linear relationship between these variables, suitable for factor analysis. The value of KOM is 0.538, which is relatively small, indicating that more common factors are needed to make the cumulative contribution rate meet the relevant requirements.

3.2 Construction Factor Variable

According to the interpretation of the total variance of the original indicators by each factor, four main factors were extracted from the 11 original indicators by using the principal component analysis method in the exploratory factor analysis method. By using them to replace the information contained in the original index, the contribution of factor variance is shown below :

Table 2 Explain Total and Cumulative Variance contributions

Composition	Extract the sum of the squares of the loads			Sum of squares of rotating loads		
	Total	Percentage variance	The cumulative	Total	Percentage variance	The cumulative
F1	3.265	29.678	29.678	2.791	25.369	25.369
F2	2.696	24.507	54.185	2.604	23.67	49.039
F3	1.821	16.553	70.738	2.142	19.476	68.515
F4	1.316	11.964	82.702	1.561	14.187	82.702

According to the empirical results in the above table, the variance contribution rate of the first factor is 29.678%, which can describe the information of the total variance of 29.678%. The variance contribution rate of the second factor is 24.507%, which can describe the information of the total variance of 24.507%. The variance contribution rate of the third factor is 16.553%, which can describe the information of the total variance of 16.553%. The variance contribution rate of the fourth factor is 11.964%, which can describe the information of the total variance of 11.964%. After extracting the four common factors, the cumulative variance contribution rate is 82.702, which can describe the information of the total variance of 82.702%. The result of factor analysis is ideal. The data in the second column shows the cumulative variance contribution rate of each principal component after the factor rotation, and the total cumulative variance contribution rate does not change after the factor rotation. However, the ability of each factor to explain the original variables has changed, in order to better explain each factor.

3.3 Factor Naming Interpretation

After extracting the four common factors, the original indicators are classified, classified into the five factors, and the factors are interpreted according to the indicators contained in the factors. In order to make the factor have naming explanatory, the variance multiplication method is used to realize the

orthogonal rotation of the factor loading matrix. The factor loading matrix before rotation and the factor loading matrix after rotation of the SPSS software are as follows:

Table 3 Component Matrix

	Ingredients			
	1	2	3	4
X1	0.788	-0.476	0.331	0.031
X2	0.452	-0.117	0.385	0.352
X3	0.743	-0.489	0.302	-0.011
X4	0.547	0.34	-0.62	0.272
X5	0.637	0.21	-0.61	-0.28
X6	0.772	-0.077	0.313	0.007
X7	-0.607	0.055	0.415	0.57
X8	-0.23	-0.062	0.391	-0.819
X9	0.271	0.86	0.251	-0.002
X10	0.085	0.713	0.426	-0.19
X11	0.288	0.892	0.219	0.081

Table4 Rotation component matrix

	Ingredients			
	1	2	3	4
X1	0.954	-0.146	0.161	-0.025
X2	0.632	0.117	-0.19	0.202
X3	0.904	-0.177	0.174	-0.06
X4	0.023	0.189	0.895	0.094
X5	0.07	0.111	0.913	0.224
X6	0.219	0.207	0.781	0.024
X7	-0.203	0.055	-0.894	0.159
X8	-0.072	0.064	0.043	-0.933
X9	0.012	0.928	0.085	0.084
X10	-0.015	0.826	-0.048	-0.221
X11	0.009	0.946	0.076	0.177

First, we set the four common factors to be F1, F2, F3, and F4. By observing the rotated factor load matrix, the first major shareholding ratio, equity balance, and equity concentration are on the first factor. The relatively large loads are 0.954, 0.632, and 0.904, respectively. These three indicators are descriptions of the shareholding structure, so we define it as the equity structure factor. The three indicators of ROE, EPS, and total net profit margin have a large load on the second factor. These three indicators are descriptions of the company's profitability. We named it the financial performance factor. The size of the board of directors, the proportion of independent directors in the board of directors, the proportion of executives holding shares, and the position of chairman and general manager have a large load on the third factor, which are 0.895, 0.913, 0.781, and 0.894, respectively. The third factor is defined as the management factor. In the past two years, whether a non-standard audit report has been issued has a large load on the fourth factor, which is 0.933. We define it as an information disclosure factor. In summary, we named F1, F2, F3, and F4 as equity structure factors, financial performance factors, management factors, and information disclosure factors. The details are as follows:

Table 5 Factor Naming Table

	F 1	F 2	F 3	F4
Factor naming	Equity structure factor	Financial performance factor	Management factor	Information disclosure factor
Including indicators	Whether the first major shareholder is state-owned shares, equity checks and balances, and equity concentration	Return on equity, earnings per share, and net profit margin of total assets ²¹³	Board size, independent directors, board members, management age, management qualifications	Has a non-standard audit report been issued in the past two years?

3.4 Computation Factor Score

In this paper, the regression method is used to estimate the score of the factor, and the regression coefficient is expressed by b_{ij} ($i = 1, 2, 3, 4, 5; j = 1, 2, \dots, 22$), and X_j ($j = 1, 2, \dots, 22$) indicates the index, and the extracted main factor F_i ($i = 1, 2, 3, 4, 5$) has a score expression of: $F_i = b_{ij}X_j$, and then the variance contribution rate of each rotated factor The sample company's comprehensive score function is derived for the weight:

$$G=0.30675F_1+0.28621F_2+0.23549F_3+0.17154F_4$$

Calculate the total scores of 20 listed companies according to the comprehensive score function and sort them, as shown in the following table:

Table 6 Sample Company's Comprehensive Score and Ranking

Code	F1	F2	F3	F4	Score	Ranking
600333	42.44	2.67	-15.22	13.97	12.60	1
002267	21.20	-1.39	0.44	3.46	6.80	2
600642	20.20	-0.93	-0.21	4.22	6.60	3
601139	17.33	-1.47	2.56	3.78	6.15	4
000421	19.48	-1.20	-0.24	2.60	6.02	5
600917	17.89	-1.72	1.84	2.04	5.78	6
000593	16.86	-0.88	-0.73	2.28	5.14	7
603689	14.70	-1.42	2.21	2.73	5.09	8
600207	16.85	-1.69	0.49	0.69	4.92	9
600903	15.30	-1.55	1.71	1.37	4.89	10
002524	14.65	-0.10	-1.69	4.23	4.79	11
603393	14.33	-0.55	0.01	3.00	4.76	12
002911	14.46	-1.22	1.76	1.43	4.75	13
603080	11.91	-0.27	1.56	3.08	4.47	14
600617	10.90	-0.98	2.14	2.77	4.04	15
600681	13.57	-0.84	0.12	0.31	4.00	16
002259	9.86	-0.60	0.51	2.61	3.42	17
002700	10.00	-0.93	0.73	1.14	3.17	18
600635	5.80	-0.31	2.95	3.92	3.06	19
000669	7.56	-0.35	1.76	2.44	3.05	20
300332	7.05	-0.38	1.41	2.26	2.77	21
600856	5.61	-0.14	1.69	2.19	2.46	22

000407	3.12	0.02	1.28	2.89	1.76	23
600333	42.44	2.67	-15.22	13.97	12.60	1
002267	21.20	-1.39	0.44	3.46	6.80	2
600642	20.20	-0.93	-0.21	4.22	6.60	3
601139	17.33	-1.47	2.56	3.78	6.15	4
000421	19.48	-1.20	-0.24	2.60	6.02	5
600917	17.89	-1.72	1.84	2.04	5.78	6
000593	16.86	-0.88	-0.73	2.28	5.14	7
603689	14.70	-1.42	2.21	2.73	5.09	8
600207	16.85	-1.69	0.49	0.69	4.92	9
600903	15.30	-1.55	1.71	1.37	4.89	10
002524	14.65	-0.10	-1.69	4.23	4.79	11
603393	14.33	-0.55	0.01	3.00	4.76	12
002911	14.46	-1.22	1.76	1.43	4.75	13
603080	11.91	-0.27	1.56	3.08	4.47	14
600617	10.90	-0.98	2.14	2.77	4.04	15
600681	13.57	-0.84	0.12	0.31	4.00	16
002259	9.86	-0.60	0.51	2.61	3.42	17
002700	10.00	-0.93	0.73	1.14	3.17	18
600635	5.80	-0.31	2.95	3.92	3.06	19
000669	7.56	-0.35	1.76	2.44	3.05	20
300332	7.05	-0.38	1.41	2.26	2.77	21
600856	5.61	-0.14	1.69	2.19	2.46	22
000407	3.12	0.02	1.28	2.89	1.76	23

3.5 Result Analysis

The factor scores, comprehensive scores and rankings obtained by factor analysis can be found that the rankings based on the comprehensive scores are very close to the actual situation. Obviously, the enterprises with the highest scores in the comprehensive scores have better corporate governance status, and All factors have good performance. And the lower-ranking companies want to improve their own governance, they need to improve on each of the main factors. The sample company Maoye Commercial has the highest comprehensive score and is far ahead of the second place, indicating that Changchun Gas has done a good job in corporate governance. Looking at Table 6, it is found that the comprehensive ranking of companies with low scores on F1 is behind, indicating that the shareholding structure has the greatest impact on corporate governance. These companies need to improve their shareholding structure to improve corporate governance efficiency; The lowest score, ranked last. At the same time, the scores of the four main factors of the company are also ranked last, indicating that Victory shares need to improve business strategies in the four aspects of ownership structure, board of directors, management, information disclosure and financial performance.

4. Conclusion

Using factor analysis method to evaluate the corporate governance of gas industry, 11 comprehensive evaluation indexes into four main factors, rate of gas industry business management, make the 23 corporate governance situation of gas industry show more clear, and it can find reasons for the deficiency existing in corporate governance, which targeted to correct, provide the basis for enterprises to improve their management level. Some Suggestions on corporate governance in the gas industry:

4.1 Optimize The Shareholding Structure and Reduce The Relative Amount of State-owned Shares.

In the established shareholding structure, the increase of other non-state-owned shares leads to the decrease of the relative amount of state-owned shares, which is mainly realized through refinancing, equity division, introduction of institutional investors or private placement of additional shares. National laws and regulations should attach importance to the study of mandatory norms in corporate governance, regulate axiomatic governance through the ultimate deterrent force of law, and enable stakeholders with impaired interests to safeguard their own interests through judicial means. This will put senior managers, major shareholders and other stakeholders in a strong position in corporate governance under the constraints of civil and criminal liability.

4.2 Strengthen The Construction and Improvement of The Independent Director System

Most of the directors are nominated by the board of directors and elected by the general meeting of shareholders. In this case, the majority shareholders are likely to choose those who are favorable to them to enter the board of directors, which makes it easy for the independent directors to be manipulated by the majority shareholders. "Not independent" from the start. When independent directors enter the board of directors to exercise their rights, they may be suppressed by internal directors and interfered by major shareholders, which makes the independence of the board of directors without any guarantee. This requires enterprises to establish a series of systems to protect the independence of the board of directors, such as limiting the proportion of independent directors elected by major shareholders, increasing the number of independent directors in the board of directors, and establishing nomination committee, audit committee and remuneration committee dominated by independent directors.

4.3 Establish a Reasonable Incentive and Restriction Mechanism For The Management

Most of listed companies in China's gas industry are reformed from state-owned enterprises, and their incentive and restriction mechanism still retains a large number of characteristics of the planned economy era. Administrative and spiritual incentive and restriction methods are the main ones, while economic incentive and restriction methods have not received due attention. At the same time, incentives and constraints are also asymmetric. Most listed companies in the gas industry in China are faced with the problem of insufficient supervision and incentives for the senior management of the company, and insufficient incentives for the scientific and technological personnel and other stakeholders of the company.

4.4 Strengthen Enterprise Information Disclosure.

Although the quality of information disclosure has improved in recent years, many enterprises still take advantage of legal loopholes and have various problems in accounting information disclosure. Therefore, the government should accelerate the improvement of laws and regulations on the quality of accounting information disclosure, increase the penalties for incomplete and untrue disclosure, and ensure that the quality of accounting information disclosure related requirements have laws to abide by.

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