An Empirical Study on the Relationship between Executive Remuneration and Corporate Performance of Listed Energy Companies

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Abstract

As more and more listed energy companies emerge, the study of the relationship between executive remuneration and corporate performance of listed energy companies has become an inevitable choice for these companies to improve their performance. However, there is still a lack of perfect executive remuneration incentive mechanism in China’s listed energy companies. The lack of correlation between the two, as well as unreasonable remuneration distribution, are unfavorable for the long-term development of these companies. In view of this, this paper first analyzes executive remuneration related theory, then uses Pearson correlation and multiple linear regression analysis to examine the relationship between executive remuneration and corporate performance of listed energy companies. The results show that all the four indicators, namely, ROE, EPS, JLZ, JZZ, have a positive effect on executives’ EC and CGB, and there is a strong correlation between executive remuneration and corporate performance. This study is of great theoretical and practical significance for listed energy companies to develop a reasonable executive remuneration system and improve their performance level.

Keywords: Listed Energy Companies, Executive Remuneration, Corporate Performance, Empirical Study.

1. INTRODUCTION

1.1 Literature Review

The study on executive remuneration management and corporate performance of listed energy companies has become a new hotspot at home and abroad. Some scholars have chosen 117 listed energy companies as samples, and from the perspective of financial subsidies, and the angle of listed companies, investors, and executives, to conduct empirical research on corporate performance. They found that the financial subsidies could help executives of private listed energy companies get more pay. For executives of state-owned listed energy companies, their remuneration is far less sensitive (Yang, 2010). Some believe that human capital is a source of innovation for listed energy companies and that the proportion of people with higher education also shows significant industry heterogeneity (Wei and Wu, 2015). In view of this, the empirical study on the human resources of 52 listed energy companies in Shanghai and Shenzhen has found that in the governance structure of these companies, there is a negative relationship between the decision-making of the board of directors and the salary gap between executives and employees, and that the independent board system has no significant influence on it. As for the performance of listed energy companies, the performance evaluation of domestic and foreign scholars are based on the support of external environment. Among them, some combine empirical analysis and normative research to examine the impact of government subsidies on the performance of listed energy companies from both economic and social aspects (Zhao and Zhang, 2014). The results showed that government subsidies would support the development of energy companies in a short term, but was unfavorable for their long-term development. On such basis, they explored the exact distribution of executives of all background under the best corporate performance, which provided some reference for the organizational reform and performance improvement of China’s energy listed companies (Liu and Hu, 2015). They also adopted non-linear measurement method to test the debt threshold of the performance of listed energy companies, and found that with appropriate use of the financial leverage, these companies could improve their debt ratio and operating efficiency (Chen and Tian, 2011). Other scholars explored the impact of industry and international diversification on the performance of listed energy companies in view of the current sustainable development of China’s energy industry. They found that industry diversification could impede the performance of these companies, and international diversification played a catalytic role for renewable energy companies, but might hinder the performance of traditional energy companies (Li et al., 2011).
Therefore, it is necessary to further explore the relationship between executive remuneration and corporate performance of listed energy companies to provide some reference for the coordination between the two.

1.2 Purpose of Research

Although many listed energy companies have set up relatively excellent incentive mechanisms for their executives, problems of such system gradually stand out in their rapid development, such as low long-term remuneration, low floating remuneration and negligence of spiritual remuneration, which restrict the development of the companies and are unfavorable for corporate performance (Kang and Jia, 2011). To solve these problems, listed energy companies actively involve themselves in related research (Hu and Mu, 2011). It is found in the study of corporate performance and CEO performance-related pay that CEO remuneration is related to corporate performance. Also, state-owned listed energy companies found in their analysis that the higher their profitability and performance level was, the higher the remuneration and equity returns of their executives would be (Liu and Ni, 2010). They learned from repeated practices and activities that the two were positive correlated with each other. Thus, listed energy companies can inspire the enthusiasm of their executives, which is conducive to corporate economic benefits and development, by formulating performance-related executive remuneration system. However, executive remuneration is highly polarized in the development of their companies (Liu and Guo, 2013). In view of this, to study the relationship between executive remuneration and corporate performance of listed energy companies is of great significance in boosting the incentive mechanism and establishing a set of corporate performance-related executive incentive and restraint mechanism.

2. THEORIES ON EXECUTIVE REMUNERATION

In listed energy companies, executive remuneration is mainly calculated with the remuneration index, as is shown below:

\[
\text{Compa Ratio} = \text{Average} / \text{Median} \tag{1}
\]

In the above formula, if \( \text{Compa Ratio} = 1 \), then the remuneration of the company’s executives is relatively balanced; if \( \text{Compa Ratio} < 1 \), then the remuneration is relatively low; if \( \text{Compa Ratio} > 1 \), then it is high. In the actual calculation, the present value of executive remuneration uses the following formula:

\[
V_n = \sum_{t=n}^{T} \frac{I_t}{(1+r)^{t-n}} \tag{2}
\]

Among them, T represents the retirement age of senior executives, t, their working life, r, their discount rate, I_n, their remuneration budget. Combined with the remuneration discount model, we get the formula below:

\[
V_n = \sum_{t=n}^{T} \frac{I_t}{(1+r)^{t-n}} \times E \tag{3}
\]

Where E represents the efficiency coefficient of executive remuneration that’s mainly calculated with the following formula:

\[
E = \left\{ 5 \times RF_0 / RE_0 + 4 \times RF_1 / RE_1 + 3 \times RF_2 / RE_2 + 2 \times RF_3 / RE_3 + RF_4 / RE_4 \right\} / 15 \tag{4}
\]

In terms of executives leaving their companies, their remuneration is calculated as follows:

\[
V_n = \sum_{t=n}^{T} \left( P_n (t+1) \times \sum_{t=n}^{T} \frac{I_t}{(1+r)^{t-n}} \right) \tag{5}
\]
Take into account the HR value and costs and other factors and calculate with the following formula;

$$V = \sum_{i=1}^{M} R_i \times P(R_i) \frac{1}{(1 + r)^t}$$

(6)

$$V = \sum_{t=0}^{22} C_i \frac{(1+i)}{(1+r)^t}$$

(7)

As is shown above, the calculation of executive remuneration of energy companies takes into account many factors. Whatever calculation model is adopted, they will be judged by relevant staff according to the following matrix.

$$P_{AB} = \begin{bmatrix} 1 & 1/2 \\ 2 & 1 \end{bmatrix}$$

(8)

$$P_{BC} = \begin{bmatrix} 1 & 2 & 2 & 1 & 1/3 \\ 1/2 & 1 & 3 & 1 & 1/3 \\ 1/3 & 1/3 & 1 & 1 & 1/3 \\ 1/2 & 1 & 1 & 1/3 & 1/4 \\ 1 & 1 & 4 & 3 & 1 \\ 3 & 3 & 4 & 4 & 1 \end{bmatrix}$$

(9)

According to the above judgment matrix, we can see that the judgment of executive remuneration of energy listed companies is mainly divided into A, B, C levels, though in actual calculation and judgment, we should also include some internal and external factors to make reasonable judgments and ensure the consistency.

3. EMPIRICAL RESEARCH

3.1 Research Hypothesis

Recent years, more and more listed energy companies have linked executive remuneration to corporate performance to motivate the former to make decisions consistent to the company’s interests. The remuneration of these executives is composed of salary (EC) and equity return (CGB) as they hold a certain amount of shares of the companies they serve. However, most scholars pay more attention to the company’s profitability and performance level, and study and use the return on net assets, earnings per share, net profit growth, net asset growth and other indicators to measure it. Among them, the return on equity (ROE) is proportional to the ability of listed companies to earn with their own capital, and the higher return on net assets is, the better the company’s operating efficiency will be. Therefore, it can be used as a measure of corporate performance. Earnings per share (EPS) refers to the proportion of earnings per share in the company’s total after-tax profits. Given the long term of it, it can be used as a measure of company’s long-term performance. Net profit growth (JLZ) refers to the company’s net profit growth year by year, which reflects the operating results of the company. The greater the growth rate of net profit is, the better the company’s operating results and performance will be. Thus, the company’s net profit growth rate can be used as a measure of company performance. The growth rate of net assets (JZZ) reflects the company’s existing asset appreciation and growth ability, that is, the stronger the company’s ability to develop is, the higher the net asset growth rate will be, which can improve the company’s performance. Assumptions are made based on the above analysis as follows:
H1: Performance of listed energy companies positively affects executive remuneration
H1a: Net assets return of listed energy companies positively affects executive remuneration
H1b: Earnings per share of listed energy companies positively affects executive remuneration
H1c: Net profit growth of listed energy companies positively affects executive remuneration
H1d: Net assets growth of listed energy companies positively affects executive remuneration
H2: Performance of listed energy companies positively affects executives’ return on equity
H2a: Net assets return of listed energy companies positively affects executives’ return on equity
H2b: Earnings per share of listed energy companies positively affects executives’ return on equity
H2c: Net profit growth of listed energy companies positively affects executives’ return on equity
H2d: Net assets growth of listed energy companies positively affects executives’ return on equity

3.2 Data Sources and Modeling

To verify the above assumptions, this paper randomly chooses the relevant data of energy listed companies in Shenzhen and Shanghai in 2016 from the websites of China Securities Regulatory Commission, HeXun.com and annual reports of listed companies, removes ST data and data of companies not disclose the annual remuneration of their executives, and ultimately determines 20 listed energy companies to be qualified samples. With executive remuneration (EC) and executive return on equity (CGB) as the dependent variables, and \( ROE, EPS, JLZ \) and \( JZZ \) as independent variables, the model is built as follows:

\[
EC = \alpha_0 + \alpha_1 ROE + \alpha_2 EPS + \alpha_3 JLZ + \alpha_4 JZZ + \epsilon \tag{10}
\]

\[
CGB = \alpha_0 + \alpha_1 ROE + \alpha_2 EPS + \alpha_3 JLZ + \alpha_4 JZZ + \epsilon \tag{11}
\]

Where \( \alpha_0 \) is the constant term, \( \alpha_1 \) is the coefficient of ROE, \( \alpha_2 \) is the coefficient of EPS, \( \alpha_3 \) is the coefficient of JLZ, \( \alpha_4 \) is the coefficient of JZZ, and \( \epsilon \) is the residual.

3.3 Descriptive Analysis

The statistical analysis of the sample data in this paper, as is shown in Table 1, provides the theoretical basis for the following regression analysis. As can be seen from Table 1, there is a big gap between executive remuneration in different energy listed companies, with the lowest income of 57,800 yuan and the highest income of 3,126,600 yuan. However, from the overall average level, there is steady upward momentum, and the mean and standard deviation remain at a stable level, indicating that the selected data is valid for further follow-up analysis.

Table 1 Descriptive Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minima</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>20</td>
<td>5.780</td>
<td>312.660</td>
<td>47.463</td>
<td>48.560</td>
</tr>
<tr>
<td>CGB</td>
<td>20</td>
<td>0.000</td>
<td>44.359</td>
<td>2.037</td>
<td>7.931</td>
</tr>
<tr>
<td>EPS</td>
<td>20</td>
<td>-0.280</td>
<td>1.680</td>
<td>0.276</td>
<td>0.323</td>
</tr>
<tr>
<td>JLZ</td>
<td>20</td>
<td>-14.250</td>
<td>23.603</td>
<td>0.657</td>
<td>4.498</td>
</tr>
<tr>
<td>ROE</td>
<td>20</td>
<td>0.10333</td>
<td>10.107</td>
<td>0.278</td>
<td>1.433</td>
</tr>
<tr>
<td>JZZ</td>
<td>20</td>
<td>-0.1367</td>
<td>1.912</td>
<td>0.218</td>
<td>0.144</td>
</tr>
<tr>
<td>List status</td>
<td>20</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
3.4 Correlation Analysis

Before the regression analysis of the relationship between executive remuneration and corporate performance of listed energy companies, we need to analyze the correlation between the variables to exclude multiple collinearity problems in the variable data. In normal circumstances, we need to use Pearson correlation coefficient to determine whether the two data sets are in the same plane. Pearson correlation analysis among the variables in the sample data is shown in Table 2.

Table 2 Correlation Between Variables

<table>
<thead>
<tr>
<th></th>
<th>EC</th>
<th>CGB</th>
<th>ROE</th>
<th>EPS</th>
<th>JLZ</th>
<th>JZZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>Pearson correlation</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CGB</td>
<td>Pearson correlation</td>
<td>0.115</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>0.453</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROE</td>
<td>Pearson correlation</td>
<td>0.051</td>
<td>0.089</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>0.375</td>
<td>0.479</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPS</td>
<td>Pearson correlation</td>
<td>0.084</td>
<td>0.088</td>
<td>0.430**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>0.296</td>
<td>0.489</td>
<td>0.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JLZ</td>
<td>Pearson correlation</td>
<td>0.013</td>
<td>0.098</td>
<td>0.189</td>
<td>0.136</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>0.472</td>
<td>0.478</td>
<td>0.090</td>
<td>0.188</td>
<td></td>
</tr>
<tr>
<td>JZZ</td>
<td>Pearson correlation</td>
<td>0.078</td>
<td>0.222</td>
<td>0.398**</td>
<td>0.428**</td>
<td>0.182</td>
</tr>
<tr>
<td></td>
<td>Significance</td>
<td>0.365</td>
<td>0.460</td>
<td>0.000</td>
<td>0.097</td>
<td>0.089</td>
</tr>
</tbody>
</table>

**represents p<0.05

As can be seen from Table 2, none of the correlation coefficients of the variables exceed the threshold value of 0.5, indicating that there is no obvious collinearity problem in the variables, and the Pearson correlation coefficient of each variable is lower than the threshold value of 0.5, which further proves that the regression model is available for the subsequent test of the results.

3.5 Regression Analysis

Through multivariate regression analysis and by using spss22.0 for empirical analysis of the correlation between independent variables and dependent variables, the paper obtains the following results, as are shown in Table 3 and Table 4, where the model analyzed is defined as “1.”

Table 3 Models

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Standard estimation error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.787a</td>
<td>0.654</td>
<td>0.621</td>
<td>32.45124</td>
</tr>
</tbody>
</table>

Table 4 Anova

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of square</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.599</td>
<td>4</td>
<td>0.198</td>
<td>3.381</td>
<td>0.049a</td>
</tr>
</tbody>
</table>

a. Independent variable: ROE, EPS, JLZ, JZZ

b. Dependent variable: CGB, EC

As can be seen from Table 3, R² is 0.654 and 0.621 after adjustment, indicating that 62.1% of explanatory variables in the independent variables can be used to affect dependent variables, and that the independent variables are valid. Meanwhile, as can be seen from Table 4, F = 3.381, and Sig is 0.049, lower than the significance level a, so there
is a significant relationship between the dependent variable and the independent variable. However, the paper further verifies the relationship between performance evaluation indicators of listed energy companies and executives’ remuneration and return on equity by T-test, and the result is shown in Table 5.

Table 5 Multivariate Regression Coefficients

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Non-standardized coefficient B Standard error</th>
<th>Standard factor t</th>
<th>Sig.</th>
<th>B’s 95% confidence interval Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>3.830</td>
<td>1.427</td>
<td>-</td>
<td>0.009</td>
<td>1.215</td>
</tr>
<tr>
<td>ROE</td>
<td>0.033</td>
<td>0.015</td>
<td>0.498</td>
<td>2.218</td>
<td>0.031</td>
</tr>
<tr>
<td>EPS</td>
<td>0.127</td>
<td>0.254</td>
<td>0.367</td>
<td>1.340</td>
<td>0.043</td>
</tr>
<tr>
<td>JLZ</td>
<td>0.197</td>
<td>0.148</td>
<td>0.287</td>
<td>1.956</td>
<td>0.049</td>
</tr>
<tr>
<td>JZZ</td>
<td>0.199</td>
<td>0.139</td>
<td>0.289</td>
<td>1.944</td>
<td>0.046</td>
</tr>
</tbody>
</table>

a. Dependent variable: EC, CGB

Table 5 shows that the significant level between each independent and dependent variable is lower than 0.05, indicating that there is a strong correlation between the independent and dependent variable, and that ROE, EPS, JLZ, JZZ can positively affect executives’ EC and CGB.

3.6 Results Analysis and Discussion

The above empirical analysis produces the following specific results:

(1) The p value of ROE is 0.031, lower than 0.05, proving that ROE has a positive effect on executives’ remuneration and return on equity. That is, Hypothesis H1a and H2a hold.

(2) The p value of EPS is 0.043, lower than the threshold of 0.05, indicating that the independent variable EPS has a positive effect on executives’ EC and CGB and that Hypothesis H1b and H2b hold.

(3) The p value of JLZ and JZZ are 0.049 and 0.046 respectively, both lower than 0.05, indicating that Hypothesis H1c, H2c, H1d and H2d hold. As the p value of JLZ and JZZ are close to the threshold of 0.05, their impact on EC and CGB is less significant.

Given the above, H1a, H1b, H1c, H1d and H2a, H2b, H2c, H2d are all validated to prove that Hypothesis H1 and H2 hold. That is, the performance of listed energy companies positively affects the remuneration of their executives, or, there is a strong correlation between executive remuneration and the performance of listed companies.

4. CONCLUSION

In summary, this paper studies the theory of executive remuneration of listed energy companies, and divides the remuneration into two indicators: EC and CGB. With ROE, EPS, JLZ, JZZ as four indicators to measure corporate performance, it looks at their relationship with EC and CGB by assuming the correlation between these indicators. It finds that all the four indicators have a positive effect on executives’ EC and CGB, and there is a strong correlation between executive remuneration and corporate performance. Listed energy companies should pay attention to such correlation to reasonably regulate executive remuneration, coordinate salary standards of the management, reform executive remuneration structure, so as to effectively improve executive remuneration and corporate performance of listed energy companies.

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