The Research on the Performance Appraisal of MD Based on the Stakeholder theory

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Abstract: Intergrading the stakeholder theory and the MD’s performance appraisal, this passage introduces a comprehensive appraisal system on the basis of the stakeholder theory, thus making the system more adaptable to the essence and strategic requirements of enterprise. Based on this, we apply the unascertained appraisal model into the performance appraisal of MD.

Key words: stakeholder; performance appraisal; uncertain measurement; company management

1 Introduction:
Since the 80s of last century, the supreme position of shareholders & the sanctity of private fortune has become a golden rule. However, during the course of practice, enterprises all over the world have run into a series of realistic problems, such as enterprises ethics, social responsibility and environmental management. All of these questions call for more attention during the operation of the enterprise to the demands of stakeholders including employees, creditors & society. Freeman & Blair believed that the ownership of the enterprise should be shared by all the stakeholders including shareholders, because all of them have made their own contribution to the enterprise for its growth and developments and meanwhile undertake the operating risks of it.

Accordingly, the benefit of these stakeholders should be fully considered and stakeholders should be given rights to take part in decision making and management of enterprises, otherwise they may badly threat the development of enterprises by quitting their investment.

Formulated in the early 2002, the regulation of China on the management of PLC also give its own explanation to stakeholder that the so-called stakeholders mainly include the major bank credits employees, consumers suppliers and community who should have the rights of claiming reimbursement, being told the statement and participating. As pillar in company, the MD plays an important role in coordinating the benefits of each party and maximizing the value of enterprise. So the index system of MD’s performance appraisal should make stakeholders as a inclusive part, then it can exactly & objectively reflect the properties and features of enterprises and function as a guide in the management of company.

2 Indexes of MD’s Performance Appraisal
Appraising the MD is a complicated project, the appraisal system should cover the appraisal of shareholders’ performance, creditors’ performance & social performance. After referring other references and thoroughly study, we gets the appraisal system as follows:

<table>
<thead>
<tr>
<th>Object layer</th>
<th>First level index</th>
<th>Second level index</th>
<th>unit</th>
<th>value</th>
</tr>
</thead>
<tbody>
<tr>
<td>The performance appraisal of MD $X$</td>
<td>Shareholders’ performance $x_1$</td>
<td>Net profit on net assets $x_{11}$</td>
<td>%</td>
<td>14.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total assets turnover ratio $x_{12}$</td>
<td>time</td>
<td>1.63 time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The rate of remaining capital $x_{13}$</td>
<td>%</td>
<td>76%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating income margin $x_{14}$</td>
<td>%</td>
<td>4.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investment ratio of exploration $x_{15}$</td>
<td>%</td>
<td>15.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current ration $x_{21}$</td>
<td>%</td>
<td>181%</td>
</tr>
<tr>
<td></td>
<td>Creditors’ performance $x_2$</td>
<td>Debt ratio $x_{22}$</td>
<td>%</td>
<td>53.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cash flow ratio $x_{23}$</td>
<td>%</td>
<td>25.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Folds of the interests earned $x_{24}$</td>
<td>fold</td>
<td>3.5fold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Property ratio $x_{25}$</td>
<td>%</td>
<td>11.3%</td>
</tr>
</tbody>
</table>
3 The Basic Knowledge of Unascertained Measurement Model

Assume \( X \) as the subject to be appraised, the number of its first level appraisal indexes is \( m \), thus forming the space of first level indexes \( \mathcal{I}_1 = \{ I_1, I_2, \ldots, I_m \} \). To every first level index \( I_i \in \mathcal{I}_1 (i = 1, 2, \ldots, m) \), it has \( k \) second level indexes, which forms the space of second level indexes based on the unascertained theory, as follows: \( \mathcal{I}_2 = \{ I_{i1}, I_{i2}, \ldots, I_{ik} \} \), \( x_{ij} (j = 1, 2, \ldots, k) \) is the measure value of second level index \( I_{ij} \) under first level index \( I_i \). The number of appraisal ranks of every second level index is \( p \), so the appraisal space is \( c = \{ c_1, c_2, \ldots, c_p \} \) and the appraisal ranks are sequential, satisfying: \( c_1 < c_2 < \cdots < c_p \).

3.1 The measure of the second level indexes by unascertained theory

3.1.1 Based on the standard of classification, set up membership function and put the measure value into the function we get the membership matrix of second level indexes of every first level index:

\[
\begin{bmatrix}
    u_{i11} & u_{i12} & \cdots & u_{i1p} \\
    u_{i21} & u_{i22} & \cdots & u_{i2p} \\
    \vdots & \vdots & \ddots & \vdots \\
    u_{ik1} & u_{ik2} & \cdots & u_{ikp}
\end{bmatrix}, \quad t = 1, 2, \cdots, p
\]

\( u_{ij} \) means the degree that the value of second level index \( I_{ij} \) under first level index \( I_i \) makes the subject pertain to \( c_i \) rank, satisfying: \( 0 \leq u_{ij} \leq 1; \sum_{r=1}^{p} u_{ijr} = 1 \)

3.1.2 Use the theory of information entropy to fix the categorization weights of second level indexes

From the point of entropy, we know:

\[
w_{ij} = \frac{v_{ij}}{\sum_{j=1}^{k} v_{ij}} \quad (0 \leq w_{ij} \leq 1; \sum_{r=1}^{k} w_{ijr} = 1) \tag{1}
\]

\( w_{ij} \) means the classification weight of second level index \( I_{ij} \) under first level index \( I_i \) and satisfies:

\[
v_{ij} = 1 + \frac{1}{\ln p} \sum_{r=1}^{p} u_{ijr} \ln u_{ijr} \tag{2}
\]
So we can get the classification weights of second level indexes under every first level index:
\[ \tilde{w}_i = (w_{i1}, w_{i2}, \cdots, w_{ik}) \quad i = 1, 2, \cdots, m \]

3.1.3 Do comprehensive measure to the second level indexes of every first level.

\[
\begin{bmatrix}
    w_{i1} & w_{i2} & \cdots & w_{ik} \\
    \vdots & \ddots & \cdots & \vdots \\
    w_{il} & \cdots & \cdots & w_{ik}
\end{bmatrix}
\]

Thus getting the first level multi-index measure matrix:

\[
(u_{it})_{mxp} = \begin{bmatrix}
    u_{i1} & u_{i2} & \cdots & u_{ip} \\
    u_{i21} & u_{i22} & \cdots & u_{ip} \\
    \vdots & \vdots & \ddots & \vdots \\
    u_{im1} & u_{im2} & \cdots & u_{imp}
\end{bmatrix}
\]

3.2 The comprehensive measurement of first level indexes based on the theory of uncertainty

3.2.1 By the method of AHP, we can get the importance weights of first level indexes:
\[ \tilde{w} = (w_1, w_2, \cdots, w_m) \quad \text{satisfying:} \quad 0 \leq w_i \leq 1 ; \sum_{i=1}^{m} w_i = 1 ; (i = 1, 2, \cdots, m) \]

3.2.2 Do comprehensive appraisal to the subject

\[
\begin{bmatrix}
    u_{i1} & u_{i2} & \cdots & u_{ip} \\
    u_{i21} & u_{i22} & \cdots & u_{ip} \\
    \vdots & \vdots & \ddots & \vdots \\
    u_{im1} & u_{im2} & \cdots & u_{imp}
\end{bmatrix}
\]

\[ u_i \text{ means the degree that the subject pertaining to } t \text{ rank.} \]

3.2.3 Identification
Because the appraisal rank is sequential, so we do the identification according to the rule of incredible recognition.

\[ k_0 \cdot k_0 = \min \left\{ k : \sum_{i=1}^{k} u_{it} (\lambda) \geq \lambda, k = 1, 2, \cdots, p \right\} \quad \text{(usually } \lambda = 0.7 \text{ or } 0.8) \]

Thus we can get conclusion that the appraisal subject belongs to \( C_{k_0} \) rank.

4 Examples
Here we take a MD of a company as an example to explain the appraisal calculation process. The value of every index is listed in table 1 and each index will be divided into four levels: (bad, moderate, good, excellent) = (c, c, c, c).

4.1 Construct the measurement function
In order to get the measurement value \( u_{it} \), we need to construct an unascertained measurement function for every second level index. Herein take the net profit ration as to net assets as an example. 5%, 10%, 15% and 20% represent bad, moderate, good & excellent respectively, accordingly, the function of unascertained measurement is established (showed in picture 1).
curve ABHK means “bad”, when \( x = 14.9\% \), \( y = 0 \); Straight line OGCIK means “moderate”, when \( x = 14.9\% \), it can be determined by formula \( y = 20(5\% - x) \), \( y = 0.02 \); by the same way; curve OHDJK means “good”, we get \( y = 0.98 \); curve OIEF means “excellent”, we get \( y = 0 \).

So we get the unascertained unascertained vector of \( x \) is \((0, 0.02, 0.98, 0)\). Similarly, we can calculate the unascertained measurement vectors of other indexes of index \( x \). We get the unascertained measurement matrix:

\[
\begin{bmatrix}
0 & 0.02 & 0.98 & 0 \\
0.28 & 0.72 & 0 & 0 \\
0 & 0 & 0.82 & 0.18 \\
0 & 0.56 & 0.44 & 0 \\
0.12 & 0.88 & 0 & 0 \\
\end{bmatrix}
\]

4.2 Calculate the vector of second index classification weight
Based on formula (1)-(2) calculate the classification weight vector of \( x \):

\[
\bar{w} = (0.2731, 0.1682, 0.1940, 0.1485, 0.2162)
\]

4.3 Appraisal the first level index
The appraisal vector of index \( x \): \( u_i = \bar{w} \cdot u_{ij} = (0.0730, 0.4000, 0.4921, 0.0349) \)

By the same way, we can get appraisal vectors of other first level indexes, thus getting the ascertained measurement matrix of first level:

\[
\begin{bmatrix}
0.0730 & 0.4000 & 0.4921 & 0.0349 \\
0.1148 & 0.5769 & 0.2871 & 0.0212 \\
0 & 0.4500 & 0.5500 & 0 \\
0.0653 & 0.2982 & 0.6182 & 0.0852 \\
0.2107 & 0.7893 & 0 & 0 \\
0.1975 & 0.6707 & 0.1318 & 0 \\
\end{bmatrix}
\]

4.4 Appraisal object
By the method of AHP, we can get the importance weights of first level indexes:

\[
\bar{w} = (0.30, 0.18, 0.12, 0.25, 0.12, 0.03)
\]

Then, we can evaluation the subject: \( u = \bar{w} \cdot (u_{ii})_{norm} = (0.0901, 0.4505, 0.4238, 0.0356) \)

Suppose \( \lambda = 0.8 \); when \( k_0 = 3 \), \( 0.0901 + 0.4505 + 0.4238 = 0.9644 > 0.8 \)
Therefore, the MD to be appraised, the performance level of object one belongs to the good.

5 Conclusions

With the rapid development of the stakeholder theory, our opinion on the nature & mission of the enterprise is greatly charged. The loyalty of stakeholders such as creditor, employers & customers has become the most important strategic resources of the enterprise. Herein we introduce the system of MD’s performance appraisal, thus making the appraisal more conform to the nature & strategic requirements of the enterprise.

Reference: