A Study on Risk Assessments of Assets Appraisal for New Energy Enterprises

Rong-zhen DU*

School of Management and Economics, Beijing Institute of Technology, Beijing, China

*Corresponding author

Keywords: New energy, Assets appraisal, Risk evaluation, Fuzzy comprehensive evaluation.

Abstract. Plenty of new energy enterprises are springing up under the circumstances of Low-carbon economy (LCE) in China. Subsequently, more and more assets appraisals need to be done. This paper aims at establishing the risk assessment index system of new energy enterprises, relying on influence of various risk factors. After that, an empirical analysis on new energy enterprises is conducted through comprehensive evaluation methods of Analytical Hierarchy Process (AHP) and Fuzzy Comprehensive Evaluation (FCE). Finally, the evaluated results present pleasurable suggestions on risk precaution.

Introduction

Under the double influence of environmental and energy crisis, multiple countries are enacting corresponding supportive policies to encourage and facilitate technology development and deployment, and to support the innovative capabilities of the new energy technologies. Accompanied with the rapid development of new energy industry, related activities such as transfer, investments in terms of shares, merger and acquisition, restructuring are being more and more frequent. In order to guarantee the asset transactions of new energy enterprises in a fair and open way with effective-protection of legitimate interest of both sides, it is in great demand to evaluate the assets objective fairly. However, the huge systematic assets appraisal project and particularities of new energy companies are detrimental when conducting asset appraisals[1]. Therefore, identifying and evaluating the risk factors effectively in the process of asset appraisals on new energy firms will not only prevent risk but also provide reasonable assurance of evaluation results and market promotion as Figure 1 shows.

Figure 1. The risk index system of new energy enterprises.
Risk Factors Influencing Assets Appraisal of New Energy Enterprises

Along with the mature encouraging policies and related technologies, new energy industry is not only attractive to the capital attention but also beneficial for the increasing demands of assets appraisal on new energy firms. Compared with firms in traditional industries, new energy firms have their own particularities which lead to special needs on assets appraisal. Based on self-conditions of subjects, environment involved and sphere of risk influence, risk factors of assets appraisal can be divided into 3 aspects: risk of external environment, risk of firms appraised, risk of operating process.

Risk of External Environment

First, stock assets of new energy firms are difficult to flow, as a result, the market evaluation methods cannot be applied generally. New energy firms in different fields have huge differences of stock assets allocation, and firm indexes are mostly discrete to the average industry ones, consequently may cause substantial difficulty to determine evaluation parameters. Second, we have increasing appraisal agencies with limitations like lack of normality and scattered small sizes. When facing interest temptation, agencies are more inclined to compete viciously. As a result, rough evaluation process and reports would be expected due to the low cost operations. Third, related legal system is not sound enough. Current laws and regulations involved in the assets appraisal are dispersed in the Corporation Law, Corporate Law, etc. Therefore, laws that could be relied on are not consistent and coherent[2]. When dealing with the same case, different laws have different statements, which results in those responsibilities and degree of violations are hard to define.

Risk of Firms Appraised

The largest capital sizes coupled with more varieties of asset firms appraised will have a huge amount of appraiser’s workload. As a result, the correctness is very difficult to ensure. The majority of new energy enterprises have relatively short operation history. If firms appraised cannot provide reliable and complete accounting statements, appraisers will not be objective enough, which may lead to evaluation risks because of the deviation to the fair value[3].

The more technological of the assets new energy enterprises appraised, especially in new fields, the more special technique and manufacturing plants they have, therefore the more accuracy of the appraisal is required.

For example, due to the progress in technology, new material, new craft and power enterprises with new energy will bear low cost production by utilizing new equipment with eco-economic viability for the same manufacturing processes. Therefore, value appraised for electromechanical devices are influenced largely by the subjective judgments made by appraisers, which is another important factor of evaluation risk.

The percentage indicators of the relative patents in new energy enterprises define that more patents in new energy firms lead to more intangible assets and thus introduce difficulties. In particular, the more special field’s patents will limit the appraisal data and the accuracy of appraised value with high risks[4].

Risk of Operating Process

The influence of the internal control of appraisal agencies is discussed herein. Currently, there are many appraisal agencies with small sizes, poor internal control, loose risk-management and lack of independent supervision. Additionally, the degree of complete information, appraisal parameters and appraisal methods selection play a pivotal role in boosting the quality of the final appraisal reports. In real practice, many appraisers rely heavily on subjective experience, less independent and sometimes even driven by self-interest to issue mendacious reports, whether overestimate or underestimate assets appraised. Analyzing and observing the fast growing economy, technological advancement and the global demands, it is quite clear that smart minds and certain ability are required to boost assets appraisal.
Establishment of Risk Assessment Model

It is a comprehensive analysis process with multiple factors to assess appraisal risks of new energy enterprises. In this regard, many factors are involved; however, some unmeasurable indicators still exist. At the same time, many factors or indicators are incomparable, thus some blurry words can only be used as very large, large, weak, etc. Therefore, this paper applies method of comprehensive indicator system establishment to know risk levels of new energy firms, through Analytic Hierarchy Process (AHP) and the Fuzzy Comprehensive Evaluation (FCE).

Seven experts from agencies partners and professional appraisers were invited to judge multiple factors concerning risk prevention. There are 2 sections in the judgment of risk prevention factors: (i) estimating relative importance of different indicators in the indicator system (ii) evaluating different effects of different indicators. From the above mentioned approaches, 7 data samples are formulated accompanied by weighted judgment matrix on different risk factors known values.

Traditional Analytic Hierarchy Process divides significance scale into 9 grades. Based on number of required elements, this paper adjusts scale to grades 1, 2, 3, 4 and 5 with a mark sheet of 1-5 grades as table 1 shows.

| Significance scale | Implication                                                                 |
|--------------------|-----------------------------------------------------------------------------|
| 1                  | Two elements have the same significance                                      |
| 2                  | The former of the two elements is slightly more significant than the latter   |
| 3                  | The former of the two elements is obviously more significant than the latter  |
| 4                  | The former of the two elements is far more significant than the latter        |
| 5                  | The former of the two elements is extremely more significant than the latter  |
| Reciprocal          | If the ratio of element i to j is $b_{ij}$, the ratio of significance of element j to i is $b_{ji} = 1/b_{ij}$ |
Table 2. Mean random consistency index table.

| Orders | RI   |
|--------|------|
| 3      | 0.58 |
| 4      | 0.89 |
| 5      | 1.12 |
| 6      | 1.26 |
| 7      | 1.36 |
| 8      | 1.41 |
| 9      | 1.46 |
| 10     | 1.49 |
| 11     | 1.52 |
| 12     | 1.54 |
| 13     | 1.56 |
| 14     | 1.58 |

Through calculation, the weighted values of criteria layer to the objective layer (entire assessment risk of new energy enterprises) are obtained. Additionally, the consistency check of the entire project risk reveals a passing value of CR=0.026<0.1 as table 3 shows.

Table 3. Weighted values of criteria layer and results of consistency check.

| Target layer A | Criteria layer B          | Weighted value | Order |
|----------------|---------------------------|----------------|-------|
| Risk prevention of new energy Enterprise (A): U | External environment U₁   | 0.072          | 3     |
|                | U₂ of firm A appraised    | 0.649          | 1     |
|                | Operating process U₃      | 0.279          | 2     |
|                | Consistency check         | CR=0.026<0.1, passed | -     |

Determination of Risk Level

As influencing factors of risk prevention in the indicator system have different impacts on risk of assets appraisal of Firm A such as very large, large, medium and slightly large. However, slightly small values are applied to depict different risk levels of factors [7]. Then, 7 experts rate accordingly to get the probability value of factors based on their risk levels and build judgment table of risk factors. Finally, based on weighted value and probability values, calculate in the fuzzy matrix to get the comprehensive assessment value of risk prevention effect in Firm A, as table 4 shows.

Table 4. Integral assessment value of effects.

|                      | Very large | large | medium | Slightly large | Slightly small |
|----------------------|------------|-------|--------|----------------|----------------|
| overall effect of risk prevention | 0.282      | 0.267 | 0.218  | 0.124          | 0.109          |
| external environment  | 0.200      | 0.430 | 0.146  | 0.100          | 0.124          |
| Firms appraised       | 0.264      | 0.268 | 0.220  | 0.137          | 0.111          |
| operation process     | 0.344      | 0.224 | 0.232  | 0.100          | 0.100          |

Known from the table, of the assets appraisal projects table 4 shows the integral risk coefficient in high level with very large and large coefficient values of 0.282 and 0.267, respectively. The risk of operating process is in significant level as well with coefficient 0.344, largest of the index system. Therefore, main risk of this appraisal project comes from the appraisal agency. At the same time, risk of firm appraised is in large level with coefficient of 0.268. Obviously, the new energy enterprise itself does not influence obviously compared with other 2 coefficients of indicators. Further, combining indicator system of this new energy firm, weight of technological and electromechanical devices are in significantly high level, which reveals the characteristic of assets appraisal in new energy firms.

Conclusion and Suggestion

In view of risk identification and estimation from above, this new energy enterprise is bearing significant appraisal risk. As subject of appraisal, the subjectivity of appraisal agencies can cause direct influence on the appraisal reports. The reasons may be technical failure of appraisers, or lack of administration and supervision of the appraisal agencies. From the perspective of results, self-
owned special particularities of new energy firms cause a significant large portion of appraisal risk. It is therefore in great demand to complete risk prevention in the process of appraisal.

First, enhance risk management mechanism of the assets appraisal for new energy firms. Starting from 3 procedures which are risk identification, risk analysis and risk evaluation, enhance the practical instructions in order to be more pertinent in evaluation process. Besides, encourage agencies to conduct risk prevention concerning on different industries and fields, so that they can formulate formal procedures based on particularities of new energy firms to minimize activities that lead to improper values.

Second, improve competency of appraisers. Whether or not asset appraisers are qualified can cause direct losses due to the evaluation risks. Therefore, it is important to improve skills of appraisers to reduce evaluation risks. The true education and training systems are necessary for fast growing economy, technological advancement and the global ranking through highly qualified talents and smart minds. They should be encouraged to learn actively, gain enough information concerning technology and operating environment, besides, continuing study should also be conducted to meet increasing requirements of assets appraisals.

References

[1] Yanting Zhu, The Risk Analysis and Assessment System of Investment on the New Energy Industry, D. Zhejiang University Master dissertation. (2011).

[2] Xuemo Pan, Analysis of Risks Categories in Assets Evaluation, J. Appraisal Journal of China. 16 (2003) 12-13.

[3] Hardin William G., Xiaoquan Jiang, Zhonghua Wu, Inflation Illusion, Expertise and Commercial Real Estate, Journal of Real Estate Finance and Economics.10 (2017) 345-369.

[4] Miao Zhang, Yuan Yang, Brief study on the existing problems and effective solutions of intangible assets appraisal, J. Brand (second half of the month), 10 (2015) 206-207.

[5] Young H. Park. A study of risk management and performance measures on new product development, J. Asian Journal on Quality, 1 (2010) 39-48.

[6] Roberta Costa, Simonluca Evangelista. An AHP Approach to Assess Brand Intangible Assets, J. Measuring Business Excellence, 12 (2008) 68-78.

[7] Kejian Hu, Study on Assessment System of Risks in Appraisal Practice, J. 13 (2013) 100-101.