

# Assessment of Business Diversification Risk in Yituo Group Company

Li Youji

School of Management, Wuhan University of Technology, Wuhan, P.R.China, 430070  
(E-mail: Liyouji@whut.edu.cn)

**Abstract** (Traditionally, business diversification is regarded as an important strategic tool for the development of a company. Nevertheless, business diversification may incur new risk due to the company's entering to a new business fields even though business diversification has risk portfolio scatter function). This paper takes Yituo Group Company in China as a case to conduct the risk analysis of business diversification. The paper conducts a risk assessment of Yituo Group Company via employing qualitative method, and finally comes to some conclusions for Yituo Group Company to cope with the risk in its business diversification.

**Key words** Business diversification; Product portfolio; Risk assessment

## 1 Introduction

The predecessor of Yituo Group Company is The First Tractor Factory, which is founded in 1955. The factory is one of the 156 national key subject programs in period of the First Five Year Plan in China. It is also the largest tractor manufacturer and one of the 512 key supporting state-owned enterprises in China. The First tractor machinery engineering Group based on Yituo Group Company is one of the first 57 national pilot enterprises, which is in national plans to implement single row. October 1992, The First Tractor Factory was renamed as China First Tractor Machinery Engineering Company. May 1997, it establishes a modern enterprise system, changing its name to China First Tractor Group Co., Ltd... August 2001, according to the national policies on deepening the reform of state-owned enterprises, it delayed implementation of the "debt to equity" from the original multi-owned company restructured into shareholding limited liability Company.

After 40 years of efforts, Yituo Group Company has tracked tractor manufacturers to develop into producing farm machinery and equipment, construction machinery, power machinery three pillars of the class of multi-series and multiple types of integrated machine manufacturing enterprises. Yituo Group actively builds a modern enterprise system in the arm conversion business to adapt to the market economy mechanism, using joint ventures, joint-stock reform, published in Hong Kong stock and release management, etc... To realize the asset restructuring and accelerate the implementation of regional, inter-industry mergers and joint enterprises have been built mainly of asset management, research, production and foreign trade, gold integration, has strong competitiveness in the domestic first-class national enterprise.

## 2 Diversification Risk Factors Analysis of Yituo Group

Professional development path can have economies of scale, division of labor efficiency and technical superiority, but it is difficult to adapt to changes in extensive market demands. Because the specialized production equipment and assets are specific in nature, which easily tied up as the market fluctuates, so they are risky and difficult to prevent in quick market fluctuation. Diversified development strategy is the path to overcome the problem of the best professional development tool. Therefore, Yituo Group develops diversity in order to reduce operational risks. However, diversification has proved to be counterproductive, increasing the risk factors. For instance, diversification leads to corporate resources dispersion, increasing of operation span and cost, industry selection errors increased. The results could cause a loss, trouble and so on. Dragged on the diversification risk factors in Yituo Group include of new business policy risks, industry entrance risk, primary industries weaken risk, R & D risk, business integration risk etc.. The risk factors point out the impact of diversification to Yituo Group in management, finance, human resources, corporate culture, corporate brand and image, marketing channels, R & D etc. aspects. Diversification is a double-edged sword. In the process of diversification, Yituo Group should consider every aspects of enterprise management. The consideration should base on enhancing the core competitiveness, making rational use of enterprise resources.

## 3 Assessment Methods and Results of Yituo Group

Fuzzy Synthetic Evaluation, also known as fuzzy or fuzzy multicriteria decision making, is a very

effective multi-factor decision making method which makes a comprehensive assessment to multi factors impact.

Assuming  $X = \{x_1, x_2, \dots, x_n\}$ ,  $Y = \{y_1, y_2, \dots, y_m\}$ , then the given fuzzy relation is :  $\forall A = (a_1, a_2, \dots, a_n) \in \xi(X)$ , and can determine a fuzzy linear transformation(taking Max-min composition).

$$R = \begin{pmatrix} r_{11} & r_{12} & \dots & r_{1m} \\ r_{21} & r_{22} & \dots & r_{2m} \\ \dots & \dots & \dots & \dots \\ r_{n1} & r_{n2} & \dots & r_{nm} \end{pmatrix} T_R : \xi(X) \rightarrow \xi(Y)$$

$$A \mapsto T_R(A) = A \bullet R = B = (b_1, b_2, \dots, b_m) \in \xi(Y)$$

While,  $b_j = \bigvee_{i=1}^n (a_i \wedge r_{ij})$  ( $j = 1, 2, \dots, m$ ), and claims that  $T_R$  is induced by fuzzy relationship  $R$ .

Assuming  $U = \{x_1, x_2, \dots, x_n\}$  are  $n$  different kinds of assessment indexes(or factors) with different weights,  $v = \{v_1, v_2, \dots, v_m\}$  are  $m$  targets to be determined in risk-profit feasible set. Comprehensive evaluation  $B$  is based on weight  $A$  of each factor.  $A = \{a_1, a_2, \dots, a_n\} \in \xi(U)$ , and  $\sum_{i=1}^n a_i = 1$ , while  $a_i$  refers to the weight of the  $i$  kind factor. According to the above propositions, separate evaluation is made to each factor by experts, which can be seen as fuzzy mapping  $f$  from  $U$  to  $V$ , that is  $f : U \rightarrow \xi(V), u_i \mapsto f(u_i) \in \xi(V)$ . According to formula  $f$ , fuzzy linear transformation  $T_f$  can be induced from  $U$  to  $V$ .  $T_f$  refers to the mathematical model of comprehensive evaluation  $B$  by weight  $A$ .  $B = (b_1, b_2, \dots, b_m) \in \xi(V)$ , while  $b_j (j = 1, 2, \dots, m)$  refers the occupied position by of the  $j$  opponent  $v_j$  (that is membership of  $v_j$  to fuzzy set  $B : B(v_j) = b_j$ ). Ordering each membership by size, the optimal diversified target combination can be determined.

When giving diversification strategy in the pre-program evaluation, there are usually four test criteria for decision-making: ① attraction test. Chosen to enter the industry must be attractive enough to make a good return on investment and lasting; ② market entry and exit costs of testing. Enter and exit the target market of costs should not be too high, so as not to erode the potential profit; ③ risks and uncertainties. Enterprises wishing to enter the new business should have a certain familiarity and ability with appropriate design and development and innovation capacity so as to ensure that the investment business risks and uncertainties will not exceed the maximum risk line; ④ talent reserves and management of comprehensive ability test.

(1) Factor set  $U = \{x_1, x_2, x_3, x_4\}$ , as noted above, the main factors of judging the investment objectives are:  $x_1$  is attractive;  $x_2$  is market entry and exit costs;  $x_3$  is risk and uncertainty;  $x_4$  is comprehensive capacity.

(2) Decision-making set  $V = \{v_1, v_2, \dots, v_6\}$ , Yituo Group scheme or under production of tractors, forklifts, loaders, roadrollers, generators and water pumps, and the six investment objectives are in the business of risk-profit feasibility sets.

According to the above required investment environment and survey information, and based on the enterprise situation, experts make assessments on four of the risk factors, which can be shown on Table 1 as follows.

**Table 1 Expert Assessments of Yituo Group Business Strategy Plan Based on Four Test Factors**

factors	tractor	forklift	loader	roller	generator	pump
Attraction	0.76	0.80	0.86	0.78	0.93	0.73
Risk feasibility	0.90	0.87	0.85	0.80	0.73	0.78
Industry familiarity	0.95	0.86	0.82	0.76	0.70	0.75
Comprehensive capacity	0.92	0.82	0.86	0.80	0.76	0.78

Then this has been a fuzzy mapping  $f : U \rightarrow \xi(V)$

$$u_1 \rightarrow (0.76,0.80,0.86,0.78,0.93,0.73) ;$$

$$u_2 \rightarrow (0.90,0.87,0.85,0.80,0.73,0.78) ;$$

$$u_3 \rightarrow (0.95,0.86,0.82,0.76,0.70,0.75) ;$$

$$u_4 \rightarrow (0.92,0.82,0.86,0.80,0.76,0.78) .$$

Thus, the availability of single-factor evaluation matrix is:

$$R = \begin{pmatrix} 0.76 & 0.80 & 0.86 & 0.78 & 0.93 & 0.73 \\ 0.90 & 0.87 & 0.85 & 0.80 & 0.73 & 0.78 \\ 0.95 & 0.86 & 0.82 & 0.76 & 0.70 & 0.75 \\ 0.92 & 0.82 & 0.86 & 0.80 & 0.76 & 0.78 \end{pmatrix}$$

Based on the market and industry characteristics, experts set weight  $A = (0.2,0.3,0.3,0.2)$ . The  $B = A \bullet R = (0.891,0.843,0.845,0.784,0.767,0.761)$ , normalized to  $B = (0.182,0.172,0.173,0.160,0.157,0.156)$ .

According to membership size, the priority order of production targets which invested by Yituo Group is: tractor  $\rightarrow$  loader  $\rightarrow$  forklift  $\rightarrow$  roller  $\rightarrow$  generator  $\rightarrow$  pump.

### 4 Conclusion

In short, the invest or produce targets of Yituo Group have different priorities, enterprises should choose the higher goal of membership investment. In order to avoid "wide spread black pepper" phenomenon, the degree of business diversification should not be too high. In the analysis, taking membership of not less than 0.160 for the excellent investment objectives, then the company should invest tractors, loaders, forklifts and rollers those 4 investment aspects of production, which may achieve the desired results. As mentioned earlier, the realization of income at risk is often accompanied by loss of potential, and investment objectives of income and risk is the risk goes with the changing and, therefore, reflect the ambiguity. Rational expectations of investors are always the greatest possible return on investment, risk the loss as small as possible. Therefore, a diversified group delay path should take

the principle of proportionality.

### **References**

- [1] Liu Li. Diversification and Its Impact on Corporate Value[J]. Economic Science, 1997, (3): 68-74(In Chinese)
- [2] Tang Hua. Strategic Goal of Diversification and Risk Management[J]. Economic Theory and Business Management, 2001, (2): 43-45(In Chinese)
- [3] Hao Xuguang. Several Problems Diversification[J]. Management World, 2000, (2): 82-85 (In Chinese)