Financial Indicators of Ship Sale and Leaseback in Fuzzy Synthetic Evaluation

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Abstract In the end of 2008, the global financial crisis triggered by the U.S. subprime mortgage crisis had a large impact on the real economy in China. Currently, the international shipping business has a unified concept of capacity to control diversity, ship sale and leaseback of shipping as a new business philosophy has a long-term potential to be invested. In this paper, fuzzy comprehensive evaluation is used to analyze the relevant financial indicators of ship sale and leaseback, and the finial conclusion is that the ship sale and leaseback in corporate decision-making is a viable option.
Key words Shipping; Financial indicators; Fuzzy comprehensive evaluation

1 Introduction

In the end of 2008, the global financial crisis triggered by the U.S. subprime mortgage crisis had a large impact on the real economy in China. China's shipping companies, especially international shipping companies were suffered an unprecedented impact. International shipping market is gradually downward and prices fall. The BDI index of international dry bulk market dropped from the highest point more than 11,700 points in 2008, Sharply to more 600 points in December 2008, and the first quarter of 2009 and 2010, the shipping market situation is still grim, BDI index is still hovering low, International container, crude oil transport market is Continue downturn, China's shipping companies are facing serious difficulties. Shipping enterprises have substantially reduced income, profits have fallen sharply, some companies appeared huge losses; net operating cash flow is negative, borrowing money from banks has difficulty. In order to maintain operations，many shipping companies sold ships to leasing companies, a large cash inflow, then the ship will be leased back from leasing company.

2 The Theories about the Ship Sale and Leaseback

In theory, the sale and leaseback is a unique form of rental, which indicates the seller (lessee) of assets lease assets from the purchaser (lesser). Accounting Standards for Enterprises No. 21 ---- Rental in China (hereinafter referred to as lease criteria) provides, whether the lessee or lesser, a sale and leaseback transaction should be as a finance lease or operating lease. One of the following five criteria should be identified as the finance lease rental. First, when the lease expires, the ownership of the leased asset transfers to the lessee. Second, the lessee has the option to buy assets; the established purchase price is expected to be much lower than the fair value of the leased asset when exercise of the right of option, and at the beginning of lease can be reasonably sure that the lessee will exercise the right. Third, if ownership of assets is not transferred, life of lease take up most life of the leased asset, which usually refers to the lease of assets accounted for 75% of life of the leased assets. Fourthly, at the beginning of the lease the lessee should pay the present value of minimum lease payments that is almost equal to the fair value of the leased asset at the beginning of the lease. Then lesser at the beginning of the lease will receive minimum of the present value of lease, which is almost equal to the leased assets at fair value, "almost" is usually held by more than 90%. Fifthly, the special nature of the leased asset，if you do not make a larger transformation，only the lessee can use. In addition to finance leases other than operating leases, sale and leaseback transaction can be formed in the form of finance leases.

3 Ship Sale and Leaseback of Fuzzy Comprehensive Evaluation of Financial Indicators

The advantage of sale-leaseback business often can be analyzed by the financial indicators. However, these indicators can not be systematically evaluated by the advantages of sale and leaseback, Therefore, in this paper, fuzzy comprehensive evaluation is used for after-sales and buy-back of the assessment operations. At the same time, AHP is used to determine the weight of various factors, and thus provide the basis for the selection of the best programs.

3.1 The introduction of fuzzy comprehensive evaluation

Fuzzy mathematical theory control is proposed by the University of California Cybernetics expert Zade (LAZadeh) in 1965, Fuzzy comprehensive evaluation method is a method of fuzzy mathematics. It can evaluate the size of the object by the composite scores for evaluation and ranking, Fuzzy evaluation can also set the value according to the principle of maximum membership level and then assess the object belongs.

Fuzzy comprehensive evaluation is such an approach, first, determine the factor set U={u_1, u_2,…, u_n}, Then determine the composition of a collection of reviews, that the judge sets，then evaluate each of single factor, then establish the fuzzy evaluation matrix R=$(r_{ij})_{n\times m}$, Re-use of AHP (Analytic Hierarchy Process) to determine each factor u_i of weight{a_i}(I=1,…n), that is we will obtained fuzzy sets A by Weight ; Will be in front of the weight of fuzzy sets and fuzzy evaluation matrix R multiplied, that are B={b_1 b_2,…, b_m}=$A_n R$, That we will obtain a new row vector B $A_n R$, in accordance with the principle of membership, we can judge whether a program is feasibility.

3.2 Ship sale and leaseback financial indicators based on Fuzzy System

From the perspective of the shipping in vestment paper in this paper, we divide financial factors which affect the sale and leaseback into business decision-making risks, costs, benefits. Among them, the risk can be further divided into financial risk and equipment risk. Costs can be divided into the cost of capital as well as opportunity cost). Benefit can be divided into (the efficiency of tax-effect), Financial risk is the company's financial structure which is irrational, inappropriate financial solvency of the company may lead investors to expect the loss of revenue decline in risk.

Financial risk is a company's financial structure which is irrational, inappropriate financial solvency of the company may lead investors to expect the loss of revenue decline in risk. Opportunity cost is the formation of business after the sale of equipment of cash inflows and put into other projects with investment income, tax effect means the equipment after the sale of pre-tax return to offset the cost of rent compared to the original equipment, the difference between depreciation per year, therefore, factor set U= {Financial risk, Equipment risk, Cost of capital, Opportunity cost}.

3.3 Determination weight of factors that affect the financial indicators of ship sale and leaseback

We apply the AHP to determine the weight factors of Financial indicators, which is a multi-objective evaluation and decision method which was first proposed by American scholar ALSaaty in the 1970s. It will be decision-makers on the evaluation of complex systems thinking process of decision-making, the basic idea is to decompose the complex issues for a number of levels by policy makers, each level is composed of several elements, then the elements of the same level, and on the same level elements, and elements of the previous level as the criterion for pairwise comparisons to determine and calculate, to obtain each factor of the weight, and thus provide the basis for the selection of the optimal program.

Using the AHP the basic steps are as follows: the first step is to make decision on the various elements and to constitute a multi-level hierarchical structure model; the second step is to select elements of the same level as the criteria for more than an element of comparison according to their relative importance to determine evaluation scale; the final step is to set up Matrix to calculate the relative importance of each factor.

4 Fuzzy Comprehensive Empirical Evaluations of Ship Sale and Leaseback

This paper analyzed shipping companies currently which are listed in the Shenzhen Stock Exchange and Shanghai Stock Exchange, and found that some businesses have adopted the model of sale and leaseback financing, the typical case is the long CAO Yun (600087, Shanghai Stock Exchange) which used sale and leaseback's financing model. CAO Yun Long is an international shipping company which engaged in petroleum and its products, its route around the world, because of the rapid development, also facing with financial crisis, the company plans to sell two ships ("Kwong Hing Chau", "long voyage hope") people's livelihood and leasing companies by 700 million Ren Minbi Yuan. At the same time the company rent back the ship from the livelihood of the people leasing companies, the lease period is 10 years, the way of repay which is to pay for 70% of the amount of financing fund and interest quarterly in equal installments in Lease-back period, pay off the balance 30% in due time, when pay off the balance above-mentioned ships belong to the company.

First, we give an evaluation of after-sale buy-back operations on fuzzy comprehensive evaluation model, set U = {financial risk, equipment risk, financial cost, opportunity cost, capital efficiency, tax saving effect}, judge set V as{good, Good, General, Poor}, appraisal each factor again, then we can calculate matrix of each single factor evaluation , and have normalized processing, then obtained a matrix

$$\begin{pmatrix} 0.2 & 0.5 & 0.3 & 0 \\ 0.5 & 0.3 & 0.2 & 0 \\ 0.6 & 0.2 & 0.2 & 0 \\ 0.7 & 0.2 & 0.1 & 0 \\ 0.4 & 0.3 & 0.2 & 0.1 \\ 0.3 & 0.4 & 0.3 & 0 \end{pmatrix}$$

Reuse AHP (AHP) to determine the after-sale buy-back service weight distribution of various factors A={0.2,0.15,0.1,0.3,0.1,0.15},

Using the main factors to determination repo sale model algorithm has been a comprehensive evaluation,

B=A×R={0.47,0.315,0.185}

In accordance with the principle of maximum degree, we know that sale-leaseback is the best choice of corporate finance lease.

5 Conclusion

Fuzzy comprehensive evaluation method for evaluating the company's financing choice is scientific and feasible，financial indicators can be taken into account the impact of various factors. Proof can be seen from the above, sale-leaseback can reduce the company's financial risk and capital cost, increase business' Net cash in flow, at the same time, improve the efficiency of enterprise's funds.

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