Research and Design of Operation Mode and Risk Control Model of Finance

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Abstract. The finance warehouse is a kind of service innovation of logistics and finance integration, and its innovative operation mode provides a new channel for SME financing. Firstly, the risk control model of finance warehouse is studied, designed and tested; on the basis of controlling regulatory risk and credit risk, the efficiency coefficient method of evaluation model is adjusted and improved; then the process of operation mode and the characteristics of each mode are studied and designed.

1. Introduction
With the vigorous development of domestic logistics and finance field, the typical mode of logistics finance, such as financial integration, emerges as the times require, the finance warehouse was first proposed by Luo Qi and Zhu Daoli in 2000. As the name implies, it is an innovative service mode which integrates finance, circulation and warehousing.[1] In the area of logistics services, banks are entrusted with the supervision, evaluation and warehousing of the value of collateral, and financial services are provided to provide financing and supporting services for small and medium-sized enterprises. However, in the face of the lack of credit of small and medium-sized enterprises, such phenomena as malicious default of small and medium-sized enterprises and repeated pledge of warehouse receipts occur from time to time. Therefore, it is very important to carry on the risk management to the financing mode of the finance warehouse, and to find and avoid these risks effectively is one of the key factors for the further development of the financing mode. [2]

2. Research and Evaluation Method of Risk Control Model of Financial Warehouse

2.1. Design and Analysis of Risk Control Model for Melt-out Warehouse
AHP is used to establish a pledge risk assessment system. The risk assessment index model is shown in Figure1.
First, the importance comparison matrix between the indicators is obtained by the two-two comparison method. The maximum eigenvalue $\lambda_{max}$ of each matrix is solved and then the weight of each factor is obtained $W_i$ and then the judgment matrix table 1 and weight table 2 between each level are obtained.

Table 1. Judgment matrix between levels.

| scale | meaning                                                                 |
|-------|--------------------------------------------------------------------------|
| 1     | The i-th risk factor is as important as the j-th risk factor             |
| 3     | The i-th risk factor and the j-th risk factor are slightly more important|
| 5     | The i-th risk factor and the j-th risk factor are of great importance    |
| 7     | The i-th risk factor and the j-th risk factor are significantly more important|
| 9     | The i-th risk factor and the j-th risk factor are absolutely important   |
| 2, 4, 6, 8 | Represents the median value of the above adjacent judgment reciprocal |

If the importance of elements $i$ and $j$ is $a_{ij}$. Then the importance of $j$ element and $i$ element is $1/a_{ij}$

Table 2. Judgment matrix between levels.

| A     | B1  | B2  | B3  | W    |
|-------|-----|-----|-----|------|
| B1    | 1   | 5   | 7   | 0.633|
| B2    | 1/5 | 1   | 5   | 0.261|
| B3    | 1/7 | 1/5 | 1   | 0.106|

$\Lambda_{max}=3.039, CR=0.034<0.1 CI=0.019$

Using the consistency test index of hierarchical total ranking, the ranking results of each index are tested. Finally, the conclusion is drawn: among the factors, the variety of pledge is the most influential, the management of pledge is the second, its subordinate index supervision ability is the most important factor. [3]
2.2. Method of evaluation of models
The efficacy coefficient method, also known as the efficacy function method, was proposed by Harrington in 1965 according to the principle of multi-objective programming. Although the principle of the method is not complicated, it has the characteristics of simple operation, strong practicability, and easy analysis and interpretation of evaluation results. [4] In addition, the weighted average method is used for the comprehensive calculation of each index, and the results obtained are more objective. In terms of operational performance, the traditional formula is:

\[
\text{Single index score} = 60 + \text{Single efficacy coefficient} \times 40
\]

\[
\text{Comprehensive score} = \sum \text{Single index score value} \times \text{The index weight}
\]

The score obtained by traditional methods may affect the accuracy of the final score because its calculation method is too simple. It has been adjusted: increase the evaluation interval of the index, and adjust the grade to excellent, good, average, qualified and poor Five levels are 1, and the corresponding standard coefficients 1, 0.8, 0.6, 0.4 and 0.2 are determined.

\[
\text{Comprehensive score} = \sum \text{Single index score value}
\]

\[
\text{Single index score} = \text{Basic points of this file} + \text{Adjustment points}
\]

\[
\text{Basic points of this file} = \text{Single index weight} \times \text{Standard factor of this file}
\]

\[
\text{Adjustment points} = \frac{\text{Single power factor} \times (\text{Upper grade basic score} - \text{Basic points of this file})}{\text{Actual value} - \text{Standard value of this file}}
\]

\[
\text{Single power factor} = \frac{\text{The actual value of the indicator} - \text{Not allowed value for this indicator}}{\text{Satisfaction of this indicator} - \text{Not allowed value for this indicator}}
\]

3. Analysis of Operation Mode of Finance Warehouse
As a comprehensive third-party logistics service platform, the finance Warehouse not only constructs a new bridge for the cooperation between banks and enterprises, but also can be well integrated into the enterprise supply chain system and become an important third-party logistics service provider for small and medium-sized enterprises.[5] There are warehouse receipt pledge, confirm warehouse (buyer's credit) and so on. summarized accordingly as shown in Figure 2.

Figure 2. Flow chart of financing mode of financing warehouse

3.1. Warehouse receipt pledge A (pledge secured financing)
In the warehouse receipt pledge business, according to the pledge loan contract signed by the mortgagor and the financial institution and the warehousing agreement signed by the three parties, the raw materials purchased by the production and operation enterprises or the finished products to be sold enter the financial warehouse set up by the third party logistics enterprises, and apply to the bank for loans at the same time; third party logistics enterprises are responsible for the acceptance of goods, value evaluation and supervision, and accordingly issued to the bank supporting documents; according to the loan application and the value evaluation report, the bank loans to the production and operation enterprises as appropriate; the production and operation enterprises sell their products in the financing warehouse as usual; the third-party logistics enterprise shall deliver the goods to ensure that the collection account of the products sold by its customers is the special account opened by the production and operation enterprise in the cooperative bank; the receiving party makes the payment
into the special account opened by the seller in the bank; the bank deducts the corresponding funds from the account of the production and operation enterprise to repay the loan. If the production and operation enterprise fails to perform or fails to perform the loan debt, the bank shall have the right to receive from the pledge. In practice, there is also an extension mode. On the basis of warehouse receipt pledge operation, third party logistics enterprises integrate social warehouse resources and even customers' own warehouses according to different customers, and carry out pledge supervision nearby, which greatly reduces the customer's pledge cost. See Figure 3 for details.

3.2. Warehouse receipt pledge model B (credit guarantee financing)

First of all, the financial warehouse directly contacts, communicates and negotiates with member enterprises that need to pledge loans, and signs pledge loan contracts and warehousing management service agreements with loan enterprises on behalf of financial institutions, to provide pledge financing to enterprises, at the same time, to provide storage management services and supervision services for the pledge deposited by enterprises, so as to integrate the two tasks of applying for loans and pledge warehousing operations, and improve the efficiency of the operation of pledge loan business. Furthermore, the loan enterprises need to make up and exit the warehouse continuously during the storage period, and the warehouse receipt or exit order issued by the enterprises need to be confirmed by the financial institutions, then the financial warehouse according to the financial institutions in or out of the warehouse notice to audit. But now these corresponding vouchers only need to be confirmed by the financial warehouse, that is, the process of confirmation is the process of auditing these vouchers, in the middle, the confirmation, notification, coordination and processing of financial institutions are eliminated, the time period of replenishment and exit operation is shortened, and the efficiency of production and marketing supply chain operation of loan enterprises is improved under the premise of ensuring the credit security of financial institutions. See Figure 4 for details.
3.3. Secured position model (buyer's credit)
In the confirmation warehouse mode, the manufacturer, the dealer, the third party logistics enterprise, the bank four parties sign the "confirmed warehouse" business cooperation agreement, the dealer pays a certain margin to the bank according to the purchase and sale contract with the manufacturer, the amount shall not be less than the price that the dealer plans to apply to the manufacturer for the delivery of the goods, and shall apply for the opening of a bank acceptance bill, specifically for payment to the manufacturer, the acceptance guarantee is provided by the third party logistics enterprise, and the dealer counter guarantee the third party logistics enterprise with the goods. The third party logistics enterprise determines the insured amount according to the control of the sales and inventory of the goods, and collects the supervision fee. After the bank draws the acceptance bill to the manufacturer, the manufacturer delivers the goods to the guaranteed warehouse, which is then converted into a warehouse receipt pledge. See Figure 5 for details.

4. Conclusions
Taking the financing difficulties of small and medium-sized enterprises as the starting point, this paper studies and analyzes the risk control model and their respective characteristics of the three modes of operation, which has certain reference significance for solving the financing difficulties of small and medium-sized enterprises in China and the upgrading of third-party logistics enterprises.
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