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**WORLD MARITIME UNIVERSITY**

Shanghai, China

**THE STUDY ON OPERATING MODE AND RISK  
MANAGEMENT OF WAREHOUSE RECEIPT  
HYPOTHECATING**

By

**YANG HENG**

**China**

A dissertation submitted to the World Maritime University in partial  
Fulfillment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**In**

**INTERNATIONAL TRANSPORT AND LOGISTICS**

2006

## DECLARATION

I certify that all the material in this research paper that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

.....

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## **ABSTRACT**

Title of Dissertation: **The Study on Operating Mode and Risk Management of Warehouse Receipt Hypothecating**

Degree: **Mater of Science in International Transport and Logistics**

Warehouse receipt hypothecating as a financing mode was introduced to China just few years. In recent years it develops very fast with the third-party logistics Corporation's rapid growing up. Logistics Corporation as a middleman creates a cooperative platform for bank and small-sized enterprise, evaded the financing risks and resolves the problem of unperfected credit system effectively in China in future long period. This dissertation is concerned with characteristics, operating mode, triple agreement and risk management of warehouse receipt hypothecating. The primary work of this study is to optimize content of agreement, make proposals of improving operating mode and increase in efficiency as well as take effective measures to evaluate and control risks.

It starts with a general introduce of warehouse receipt hypothecating. An overview of the development of warehouse receipt hypothecating, status quo and its bottlenecks for three participants are provided. An analysis of selective advantages and disadvantages of warehouse receipt hypothecating is presented in order to probe deep and understand the heart of this business better. This dissertation puts more effort into improvement of operating mode, agreement designing, risk controlment and evaluation of hypothecating rate using VAR model. The findings of the empirical and theoretical study indicate that if only taking proper measures of risk management, warehouse receipt hypothecating is a low-risk financing mode.

**KEYWORDS:** Warehouse receipt hypothecating, Operating mode, Risk management

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## **LIST OF ABBREVIATIONS**

CMST	China National Materials Storage and Transportation Corporation
Corp	Corporation
UPS	United Parcel Service of America, Inc.
US	United States
VAR	Value at Risk
WMS	Warehouse Management System
WR	Warehouse Receipt

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 ORIGIN AND DEVELOPMENT OF WAREHOUSE RECEIPT HYPOTHECATING**

Warehouse receipt is defined the document guaranteeing the existence and availability of a given quantity and quality of a commodity in storage for safekeeping; often used in cash and futures transactions instead of having to deliver the physical goods or commodities. ([http://www.investorwords.com/5283/warehouse\\_receipt.html](http://www.investorwords.com/5283/warehouse_receipt.html))

Warehouse receipt hypothecating means the pledgors deliver the commodities into the warehouse (bonded or non-bonded), then the commodities must be stored and given custody by logistics company which will issue the warehouse receipt as trust receipt to pledgors, the pledgors could ask the bank for a loan by right of warehouse receipt, then bank provides a loan based on a certain proportional value of goods. In this situation logistics Corp acts as a custody agent. Therefore, warehouse receipt hypothecating is not only a finance product but also a sort of logistics service (Zheng Jinbo & Qi Meizhi, 2003, pp.20-21).

The earliest records of warehouse receipt hypothecating dating from as early as the period of 2400 B.C. in Mesopotamia is corn warehouse receipt. In England the

earliest paper currency is convertible warehouse receipt of silver mine.

In the world the most comprehensive finance-logistics system exists in North America and Philippines etc. Taking example for United State, the primary business mode of finance-logistics system is warehouse receipt hypothecating for farm products and warehouse receipt not only is used as pledge<sup>1</sup> of right toward bank but also circulated as a payment instrument. American financing-logistics system is supported by government. As early as 1916 US enacted an act called “US Warehousing Act 1916” on which U.S. established a complete set of systemic rule of pledge of warehouse receipt based, this system has become one of the most important financing methods for family farm.

In contrast with developed country, the business of warehouse receipt hypothecating in developing country began later. Hence at present system is not perfect. The trade freedom in Africa attracted a lot of foreign investment companies at earlier time that consist of banks, borrowers and hypothecating management companies and contracted three-parties hypothecating management agreement through which borrowers or pledgors obtain credit to a certain extent in order to take the financing opportunity. However, this kind of warehouse receipt is only able to open to banks instead of borrowers and is barren of negotiability. In Africa a more successful example is Zambian system of logistics and bank. It is not the governmental system, but a self-support corporation named Zambian Agricultural Commodity Agency Ltd supported by Natural Resource Institute. This company is not controlled by government, so it adapted well to Africa policy and economy without government’s intervention.

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<sup>1</sup> In this dissertation, the meaning of pledge is identical with hypothecate. Both are interconvertible.

According to the survey the propellant of warehouse receipt hypothecating is the third-party logistics company in China but the propellant is finance organization in developed countries. In China the business of warehouse receipt hypothecating appears and develops with the growth of third-party logistics. In addition to modern logistics service, the third-party logistics corporations need to provide finance service in company with finance organizations in the operating process of warehouse receipt hypothecating.

Chinese scholars began to research on warehouse receipt hypothecating in 1998, whereafter several banks and logistics corporations attempted to operate this kind of business. As far as I concerned the development of practice of warehouse receipt hypothecating is faster than development of theoretics. In the year of 1999 CMST (China National Materials Storage and Transportation Corporation) tried to cooperate with some banks. At the end of 2000 Agricultural Bank of China start this business in limited area. From then on the market of warehouse receipt hypothecating expanded rapidly, a number of corporations, commercial banks and professional logistics corporations accepted this particular hypothecating loan mode and actual effect is as same as theoretical study that it benefits for three parties. In the last few years the increment speed of turnover of warehouse receipt hypothecating reaches 50% upwards. Take an example for CMST, the number of her clients is about 9 in 2001, year of 2002 reached 15 and 2003 reached 20(Hong Shuishen, 2004,67-78). The range of commodities hypothecated has been expanding from five sorts involving ferrous metal, non-ferrous metal, household appliances, paper and chemical products before 2002 to nine sorts in 2003. Simultaneously, the financing scale has been increasing constantly. In 2002 the line of credit granted by bank to CMST is RMB 1 billion, in 2003 the number exceeded RMB 2 billion. Therefore, in China, the development of warehouse receipt hypothecating from a purely academic discussion

to extensive operating practice only took ten years, which show a striking contrast with foreign countries taking long time. Certainly the fast growth of warehouse receipt hypothecating profits from amazing swift growth of Chinese economy.

## **1.2 SIGNIFICANCE OF STUDY**

The sustained and stable economic growth of Chinese economy depends on the stabilization and support of finance market. Controlling the finance risks should not be disregarded. At present, Chinese finance system is not very sophisticated. Finance organizations enhance the difficulty of financing for medium and small-sized enterprises in order to control risk, which lead to putting encumbrance on common channels of financing and loan. On one side, the medium and small-sized enterprises which have huge inventory are not able to raise money to purchase materials; on the other side, banks hold much unused money being afraid of can't taking loan back. Two sides both are trying to find out effective measure to resolve this contradiction. So warehouse receipt hypothecating maybe can carry this mission to reduce risk in a long period of time.

This dissertation is about warehouse receipt hypothecating in China as a relative new financing-logistics service from which three parties consisting of banks, small-sized enterprises and logistics providers benefit. The dissertation finds out subsistent problems and put forward effective standard operating process, particular terms of three-parties agreement and measures of operation through qualitative analysis and quantitative analysis, accordingly table constructive proposals for banks to extend this business and for logistics corporations to manage risks.



### **1.3 ACTUAL BOTTLENECKS FOR WAREHOUSE RECEIPT HYPOTHECATING**

As for Chinese banks, national banks don't start revolution of property right at all and non-national banks need to enhance ability of developing market. Social credit system is not sophisticated. Hence banks would like to provide loans to enterprises through conventional mode. However for small-sized enterprises direct financing is also more difficult. In China bank loan consists of unsecured loan, secured loan and bill discounted. Thereinto secured loan means loan on guarantee, loan on mortgage and hypothecated loan. Banks consider small-sized enterprise having lower credit rating and the commodities, from small-sized enterprise, which can be used to mortgage are very few. Furthermore, medium and small enterprises can hardly be guaranteed by big-sized enterprises and in practical operating activities commercial bills are less applied. So accepting the services of unsecured loan, secured loan and bill discounted is at present hard for medium and small-sized enterprises.

In addition how the banks take the possession from pledgor is also a question. In China finance organizations are not able to engage in other non-finance activities, they have to depend on the third-party except for pledgors to give services of custody and storage. Banks hardly find right storer for each business deal when facing a large number of small-size enterprises as well as are usually unwilling to accept the fact that the goods stored dispersedly in pledgors' warehouses themselves even though supervised by the logistics company.

As for small enterprises, it is common that they would like to hypothecate raw materials, products or movable property having powerful cashability and being status of storage. In the meantime, with respect to negotiable stocks, shares and securities,

the small-sized enterprises tend to convert into cash directly during the period of financial strain.

For value assessment of hypothecated goods, big-sized enterprises can absorb these charges of assessment and procedure owing to large amount of loans. However, medium and small-sized enterprises, which apply for small amount of loans maybe hardly bear the expensive charge.

As for logistics corporations, because of lack of formal evaluation for logistics providers, there are being some small logistics companies with weak level of control, bad credit and incapability of compensation. Banks need to assume huge risk. At the same time logistics corporations not only provide storage service with assuring security, protection against the tide and mildew but also give custody of hypothecated goods and some value-added services.

Now in China many warehouses under extensive management having obsolete facilities generally don't link up the information network with banks, which induces unsmoothed custody. Even some logistics companies employ the WMS(warehouse management system) effort should be made by logistics companies in term of collecting information about pledgors, exchanging analysis of information with banks and controlment of operating process in order to improve service ability.

**CHAPTER 2**  
**THEORETICAL ANALYSIS, ADVANTAGES AND DISADVANTAGES OF**  
**WAREHOUSE RECEIPT HYPOTHECATING**

**2.1 REVIEW OF FINANCIAL AND LOGISTIC LITERATURE**

Warehouse receipt hypothecating as a financing mode plays an important role in finance development with other finance products together in China. Seen from International market some foreign companies have formed a set of ripe management mode. For example in Holland as professional financing company has entered Chinese financing market to do business. However, in general, the business of warehouse receipt hypothecating only serve agriculture and some special industries. Moreover the market environment and legal system of developed countries is more sophisticated than China. So warehouse receipt hypothecating is just considered a type of providing loan by banks in foreign countries and is not applied universally in whole economic society.

Seen from Chinese market warehouse receipt hypothecating is a new and rising financing and logistics mode. Because it is more suitable for Chinese market condition, many finance organizations, logistics corporations and small-sized enterprises are willing to accept and do this business. It has become a disregarded financing instrument for enterprises and value-added logistics service.

Chinese academia has started to engage in the research of warehouse receipt hypothecating since 1998. In 1998, Mr Guo Zhenlin discussed the function of warehouse receipt in term of hypothecating. He thought warehouse receipt hypothecating can extend the sale time of seasonal farm products for farmers, help farmers to get short-time loan that invested in reproduction and relieve pressure of capital. Simultaneously, he set forth several problems that there are no unified form of warehouse receipt, no authoritative assessment for hypothecated goods grade, lack of insurance and supervisory mechanism and perfect legal environment. In 1999 Professor Ren Wenchao's article in "Scientific Decision-Making" introduced detailedly the financing process based on hypothecated goods. In the same year, Mr Ren Qisan discussed the financing business based on order form which is similar with business of warehouse receipt hypothecating. In 2002, professor Fang Shaokun probed into legal issues in term of warehouse receipt and its currency from juristic angle, which filled a jural vacancy. Professor Zhu Daoli and Doctor Luo Qi in the year of 2002 raised a third-party logistics service innovation that is Financing Warehouse model and they discussed its service functions and operation model. In fact it is a higher-level and integrative model of warehouse receipt hypothecating. In 2005, Zeng Wenqi from Xiamen University discussed the design principle and risk management of warehouse receipt hypothecating. He considered that the Information Asymmetry is a significant problem existing between the bank and enterprise. In the process of credit loans, enterprises know more information about profit and loss themselves and true interior information, being on a good wicket; but banks don't know these information about enterprise, so being on a bad wicket. Based on the condition of Information Asymmetry banks have no choice only to apply the same interest rate to all loans regardless of enterprises' size. High rate will depress the financing efficiency. Therefore although warehouse receipt has a financial value, this business is difficult to carry on smoothly, if banks deal directly with enterprises.

However, Logistics Corp acting as a bridge between bank and enterprise improves the above situation.

## **2.2 ASSESSMENT OF PRACTICE OF WAREHOUSE RECEIPT HYPOTHECATING**

With the emergence of warehouse receipt hypothecating and its development, we find that warehouse receipt hypothecating is suitable for China financing market in contrast with other financing modes as it can better solve the problems between banks and small-sized enterprise. But everything has its two sides in particular during the stage of development. The commentaries focus mainly on the practical and theoretical pros and cons of warehouse receipt hypothecating with regard to specific application.

### **2.2.1 Advantages of Warehouse Receipt Hypothecating**

#### **2.2.1.1 Raising the Utilization Ratio of Sedimented Capital**

In the past enterprises usually need to mortgage real estate or secure by superior authorities to make a loan. But for medium and small-sized enterprises, especially for those liquidity enterprises which have no enough real estate and pledged or secured asset, it is hard to get loans. Furthermore inventory of products may tie up important floating capital as well. As for banks handling with great deal of real estate like land and workshop is very troublesome, which make banks cautious to provide loan. Capital is blood of enterprises warehouse receipt hypothecating convert static inventory into cash and make small-sized enterprises get loans, it promotes the economic circulation of the whole social economy. The results with statistics show

that the number of capital that was tied up in completed products was 729.6 billion by the end of 2002. If the raw materials and completed products can be pledged by way of warehouse receipt hypothecating for financing, in fact it builds a bridge between banks and small-sized enterprises and helps some enterprises in dire need of capital of technical improvement and sourcing money to get loans. Changjing Nonferrous Metals Company's business of warehouse receipt hypothecating is a very good example to prove this financing effect. Actually Changjing only had RMB 10 million at the beginning, but she needed a material inventory of RMB 30 million. So Changjiang used warehouse receipt hypothecating to accomplish object. First she bought 10 million materials and then applied for hypothecating loan based on these bought materials, using hypothecating loan Changjing continued buying materials and applied for hypothecating loan again. During whole process she did 3 times like this, at last Changjing got a 29.5 million materials inventory. Warehouse receipt hypothecating helped enterprises with limited capital to gain the enough money to purchase raw materials.

#### **2.2.1.2 Reducing the Risk of Loan for Bank, Promoting the Effective Development of Finance Market**

Because Chinese credit system is semi-developed and credit crisis still exists, for example, a great deal of loans can not be got back by banks. Bad or died debts had led to high ratio of non-performing loans of the commercial banks. According to the statistics by the end of 2003 the ratio of non-performing loans is 19%. However before erecting a vast perfect social credit system banks need to find an appropriated way of financing by which the economic development can be satisfied and banks risk can be averted. Warehouse receipt hypothecating in contrast with credit financing reduce the risk of loans for banks effectively, has strong cashability and liquidity

comparing with mortgage of immovables and accelerate the speed of withdrawal of loans from enterprises as well. Banks utilize this relative new financing mode in China cooperating with independent logistics corporations that are responsible for warehouse management and delivery, to help small-sized or privately-run enterprises get money. The bad debts will not come into being as long as banks choose hypothecated goods be easy of versatility and cashability.

### **2.2.1.3 Logistics Corporations Employ Their Professional Advantage in favor of Development of Warehouse Receipt Hypothecating**

Professional logistics companies are inartificial custodian of hypothecated goods. Yet only professional and at least average-sized logistics providers having some required conditions can become just and fair third-party middleman or reliable indemnitor. As for banks the advantages of risk aversion are as follows. Firstly logistics companies have a lot of customers, because of long-term cooperation relationship the credit standing of enterprises and sale information of products are well known by logistics corporations, which avert risks of clients' credit effectively. Secondly, because some logistics companies have strong distribution network which may help banks cash in the hypothecated goods quickly when the price of goods fluctuating. Thirdly, banks transfer the risk of custody of hypothecated goods to logistics corporations, but a competent logistics provider must possess perfect management system, advanced WMS(warehouse management system), effective interior countermeasure and good communication with banks. Fourthly, Avert risk of loss of goods by the agreement concluded that logistics corporations should undertake bank's liability as bank is the holder of warehouse receipt, if loss of goods that arise from logistics provider's breach of duty.

The rapid development of warehouse receipt hypothecating cannot be dissociated from improvement of specialization, standardization and scale of logistics corporations. Big-sized logistics companies are able to manage and supervise hypothecated goods effectively avoiding loss of goods and monitor fluctuation of market price to give assessment or early warning.

## **2.2.2 Disadvantages of Warehouse Receipt Hypothecating**

In comparison with other financing modes, the warehouse receipt hypothecating is more suitable for small-sized enterprises and banks in Chinese market at present. However, besides pros we have to consider some cons composed of external and internal factors.

### **2.2.2.1 Unperfected Legal Environment**

In the whole process if pledgor can't repay the overdue loans, bank can sell the goods and go to court to get payment. But only perfect law environment ensure the bank's right and interest. In addition there are many law vacancies and blurry regulations under PRC law with regard to force ad effect, for instance, for the relationship of warehouse receipt and warehouse contract, now scholars hold two points of view of which one is that warehouse receipt is regarded as formal contract. Contract doesn't set up, if warehouse receipt not issued. Another is that warehouse receipt is a certificated document and contract has set-up formerly. For another instance, there are no express provisions regarding only pledgor can picking up goods. In the practical process of operating, logistics providers have own regulations, some regulate warehouse receipt is valid; some regulate particular person is valid. All of nonstandard regulation is an encumbrance on the deep development of warehouse



receipt hypothecating.

#### **2.2.2.2 Difficulty of Agreement Designing**

In the whole process of financing of warehouse receipt hypothecating, logistics corporations actually undertake risks. Therefore the custody charge is a primary income for logistics corporations, but in fact Logistics Company is an agent who provides a kind of service, service is intangible, it is not easy to negotiate charge rate with banks and enterprises. If charge rate is too high, the profit of bank maybe decline then this cost will be transferred to enterprises. The increasing of financing cost for enterprises may limit the development of warehouse receipt hypothecating. Therefore three participants should design a reasonable charging standard in agreement to promote the healthy development.

#### **2.2.2.3 Risk Problem**

There are two kinds of trustee-beneficiary relationship between logistics providers and banks as well as between logistics providers and enterprises (or called pledgor). First as agent of bank logistics provider is responsible for goods security, category and quantity. Second as agent of pledgor logistics provider is in charge of warehouse management involving inbound, outbound, explosionproof, waterproof, dustproof, tamperproof and mouldproof etc. Based on the relationship of trustee-beneficiary bank and logistics corporation need to bear potential risks. Risks encountered in the process of warehouse receipt hypothecating will be further discussed in the fourth chapter.

## **2.3 THE COMPARISON BETWEEN WAREHOUSE RECEIPT HYPOTHECATING AND OTHER FINANCING MODES**

Warehouse receipt hypothecating as a kind of financing mode is similar to the other finance products in some aspects but also presenting a great of diversities.

### **2.3.1 Comparison between Warehouse Receipt Hypothecating and Pawn**

Pawn means pawnbroker lends money at a high interest rate and holds some of the borrower's personal goods as a pledge or as security, to be redeemed when borrower repay the principal and interest or to be sold to the public (in a pawn shop) in the event of default. The particular characteristics are shown in Table 2.2.

Pawn is exactly a kind of especial hypothecating. The legal subject of pawning must be legitimate pawning organization. In the whole process of pawn the pawn shop is responsible for custody. When borrower redeems original goods, the custody function of pawn shop comes to a close; when borrower failed to redeem goods, the custody function will continue (Liu Bo, 2004). In contrast the custody function of warehouse receipt hypothecating is performed by third-party Logistics Corporation within the custody time. But when borrower failed to repay the delinquent debt, the performance of custody function may be transferred along with bank claiming right of pledge.

### **2.3.2 Comparison between Warehouse Receipt Hypothecating and Traditional Loan of Pledge**

Traditional loan of pledge means pledge of movables and rights i.e. the pledgor

transfers the possession of his pledged property to the pledgee, as a security for debt. If the pledgor defaults, the pledgee, shall, in accordance with the provisions, be entitled to convert the property into money as payment of the debt or enjoy priority of having his claim satisfied with the proceeds of auction or sale of the pledged property (Guaranty Law, 1995). The movables and rights, as pledged property, must conform to the legal provision. Pledgee shall enjoy the ownership and right of disposing of pledged property according to relative law. In the meantime pledgee should issue a pledging guarantee to commercial bank for borrower. The participants of traditional loan of pledge mostly include bank, pledgee and borrower, but then the participants of warehouse receipt hypothecating include bank, purchaser, vender and logistics Corp etc. Hence the relationship between participants of warehouse receipt hypothecating is more complex than traditional loan of pledge.

A comparison of the basic features of warehouse receipt hypothecating, traditional loan and pawn is shown in Table 2.1.

**Table 2.1 Warehouse receipt hypothecating versus traditional loan of pledge and Pawn: Basic characteristics**

	<b>Warehouse receipt hypothecating</b>	<b>Traditional Loan of pledge</b>	<b>Pawn</b>
<b>Participant</b>	Finance organizations (banks), enterprises, logistics Corps	Finance organization (banks), enterprises	Pawnbroker, pawnshop; small-sized enterprises and individuals
<b>Target</b>	Increase core competing power; create cooperating platform for banks and enterprises; widen	Get enterprise's operating capital	Get production fund quickly and agilely with higher financing cost

	financing channel; raise capital utilization ratio		
<b>Complexity</b>	More Complex	Simple	Simple
<b>Characters of financing</b>	Pledge of Right	Loan of pledge	Take out assets; short period; convenient; usury; unequivalence; little trading money; low risk for pawnbroker
<b>Extent of Innovation</b>	Innovative	Traditional	Traditional

## 2.4 CONCLUDING REMARKS

Although there are some obvious deficiencies or risks pertaining to warehouse receipt hypothecating, the business practices prove that the advantages outweigh drawbacks. Under the governmental rules which prescribe that financial organizations can not engage in other non-finance businesses, Logistics Corporations instead of banks hold the physical possession of the goods and assist banks in assessment of goods value, auction and resolving some difficult problems. Moreover substituting Logistics Corporation for enterprise to supervise pledged goods could attract more pledgors. CMST has presented a good example of warehouse receipt hypothecating for us, investigation shows that CMST has never handled any bad debt since starting this financing mode. Proof by fact is that as long as logistics companies take appropriate risk countermeasures, the actual risk is very low. Logistics companies could raise more value-added storage service through the cooperation with banks and enterprises as well as blend into supply chain of enterprise as a third party trusted by banks and enterprises.

In conclusion, any new attempt that may boost the economic development in China can not be stopped by its conquerable disadvantages. Warehouse receipt hypothecating has been adequately tested by empirical evidence.

## **CHAPTER 3**

### **OPERATING MODE ANALYSIS AND IMPROVEMENT**

#### **3.1 INTRODUCTORY REMARKS**

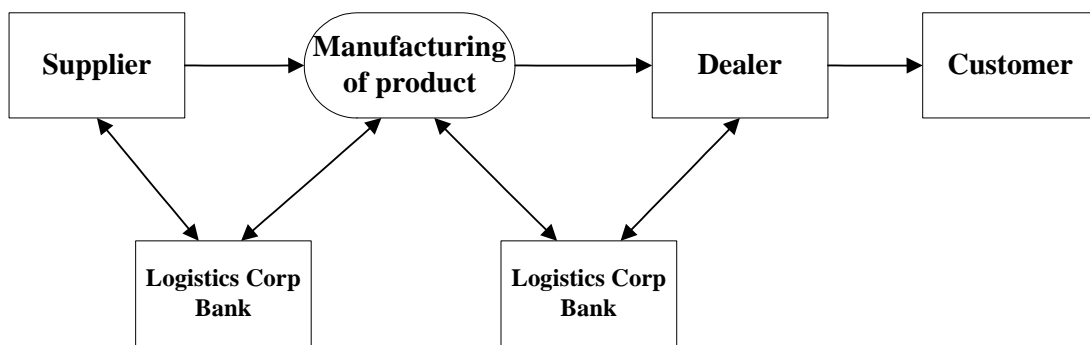
In the particular process of operation, various financing demands are made by different enterprises. Some enterprises pledge raw materials for financing, some pledge completed products for financing; some enterprises only require logistics companies to provide custody service, but some require integration of credit service. Therefore, warehouse receipt hypothecating need diversified operating modes, which are able to accommodate to the new requirements. Moreover different kinds of banks also have distinct structural establishment and work characteristics, for example state-owned commercial banks and stock-holding banks in China. To satisfy different banks' requirement, the cooperation ways should be flexible and operation also should have diversified modes. Now in practice the hypothecated goods mostly correspond to express provision of Guaranty Law of the People's Republic of China<sup>2</sup>(see Appendix A) with regard to pledge of movables and pledge of right. In China warehouse receipt hypothecating belongs to a pledge of right.

From the point of view of supply chain, for logistics corporations the warehouse receipt hypothecating can cover two fields composed of raw material supply chain

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<sup>2</sup> The Guaranty Law of the People's Republic of China, adopted at the 14th Meeting of the Standing Committee of the Eighth National People's Congress of the People's Republic of China on June 30, 1995, is hereby promulgated and shall enter into force as of October 1, 1995

and products supply chain. Small-sized enterprises normally employ cash settlement, which lead to stress of cash. Warehouse receipt hypothecating help small-sized enterprises get loans to purchase raw materials and then the raw materials are delivered to logistics provider' warehouse as being hypothecated goods. The loan will be amortized during the maturity period. In the same way, the capital is tied up in products, in order to get floating capital small-sized enterprise store the products in the logistics provider's warehouse for future demand in sale season and pledge products to banks to get hypothecating loan. Subsequently the loan will be amortized by sale revenue and enterprise's special account opened in bank receives the payment for hypothecated goods. As an important link of supply chain of sale, logistics corporations not only provide storage service but also are able to be responsible for outbound logistics. Figure 3.1 shows the position of Logistics Corp and bank in supply chain.



**Figure 3.1 The position of Logistics Corp and bank in supply chain**

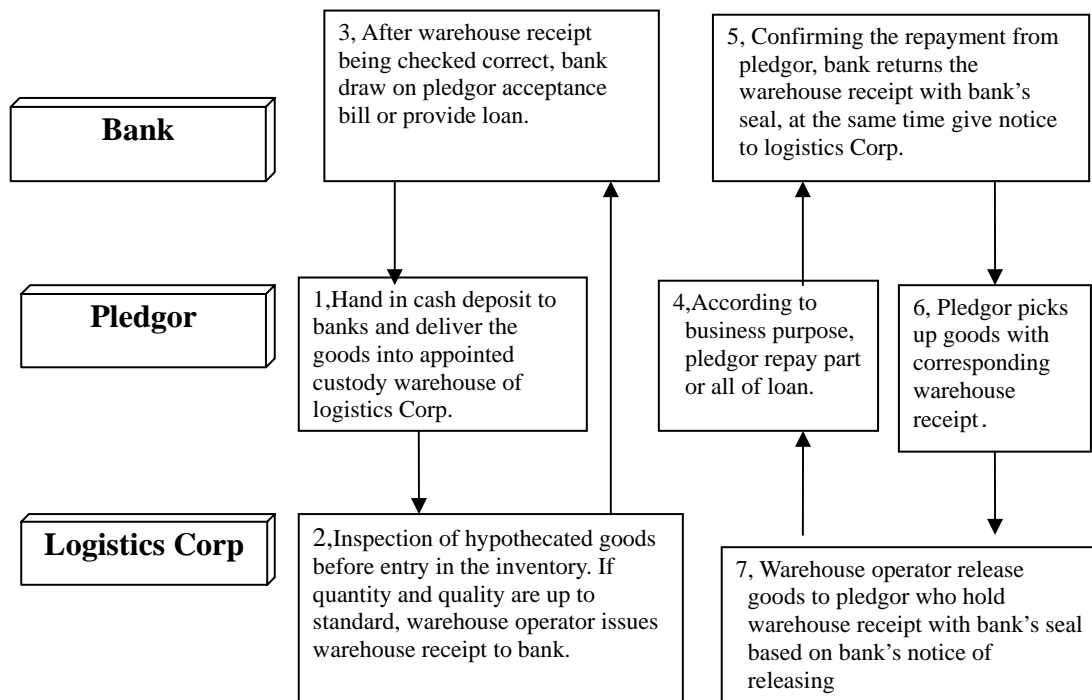
## **3.2 ANALYSIS OF OPERATING MODE**

### **3.2.1 Analysis of Process**

At present to satisfy the various demand of banks and enterprises that urgently need money, there are several types of operating modes of warehouse receipt hypothecating applied by Chinese banks and Logistics Corps including typical operating mode, confirmed warehouse, vender credit and financing warehouse etc. But in fact other operating modes despite whatever they called, are all based on basic operating mode to start off. Hence standard operating process can redound to the efficiency and fast development of warehouse receipt hypothecating. Next the discussion will center on the standard operating mode of warehouse receipt hypothecating.

Typical operating mode is just basic mode. Pledgor delivers the goods to the logistics provider's warehouse, and then warehouse operator issues warehouse receipt--a written acknowledgment for receipt & storage of consigner's goods. With WR enterprise is able to apply for loans from the bank that will provide a loan subject to the value of goods. Goods will be stored and monitored by the logistics corp. Figure 3.2 shows a basic and standard operating process.





**Figure 3.2 Basic operating flow of warehouse receipt hypothecating**

The characteristics of this process are as follows:

- The proprietary right of hypothecated goods should be clear.
- The characteristics of hypothecated goods are versatile, cashability, price stability, not easy to outdate and deteriorate, easy to storage, less nonphysical loss and specified dimension that is convenient for measurement.
- Hypothecated goods are given custody by logistics Corp, and three parties involving bank, pledgor and logistics Corp sign “cooperating agreement of warehouse receipt hypothecating”.
- If the total value of hypothecated goods is not less than promissory amount, the goods can circular flow i.e. dynamic hypothecating which ensure goods first in first out.

The explanation of operating flow diagram:

- Client (or called pledgor) delivers the hypothecated goods into custody warehouse. At the same time Bank forwards the order form of hypothecated goods to warehouse operator after receiving the security deposit. The order form should contain order number, order date, the name of client, product code, goods type, goods quantity and estimated time of arrival etc. And client should forward the information of transport based on this order form to warehouse operator. The information contains order number, product code and estimated time of arrival etc. Warehouse operator starts to prepare for entry into warehouse including personnel, ground and document.
- Before arrival of goods warehouse operator makes the entire ready ensuring the ground clear and full documents. According to the delivery order hold by client, operator checks up delivery label (including client name and delivery number) carefully, record goods quantity and type. Based on client's inspecting standard warehouse carries out warehouse-in inspection. If the goods pass the inspection, operator sets his hand and logistics corporation's seal to a delivery order. Warehouse operator should input the inbound information of goods into WMS. If goods can't pass the inspection, warehouse operator should notify the bank right now and wait for the instruction of bank.
- After bank checks the order form of client against the hypothecated goods information given by custody warehouse, Logistics Corporation will issue corresponding warehouse receipt to bank. Bank draws on pledgor acceptance bill or provides directly loan based on correct record of warehouse receipt and hypothecating rate.
- During the hypothecating period time client repays a certain amount of loan,

accordingly bank issues” Notice of Releasing Goods” to warehouse. The” Notice of Releasing Goods” should contain the goods list, goods names, kinds and quantity as well as bank’s seal.

- After receiving the releasing notice, warehouse operator should prepare goods for outbound. At the same time client should provide code of picking-up order, goods quantity, picking-up man’s name and truck’s registration number. After arrival of clients, operator must check up the content of Notice of Releasing Goods” the client provides, obligate seal and signature of client on it.
- Warehouse operator delivers the released goods to client. And input corresponding outbound information into WMS.
- If client breaks the agreement, does not pay off the loan or replenish the inventory. Bank has right to dispose of hypothecated goods.

### **3.2.2 Standard Triple Agreement**

In the whole operating process, the triple agreement made by bank, logistics corporation and enterprise is the most important part. It stipulates three parties’ rights, obligation and relevant requirement. But at present there is no clear provision by Chinese laws for the hypothecating and custody agreement i.e. triple agreement. Different banks and logistics corporations have their own agreements. Nonstandard hypothecating and custody agreement will retard the standardization of this business. Next, the basic terms of agreement will be discussed. Besides some common terms of agreement, a standard hypothecating and custody agreement should contain some special terms as follow:

- The provisions regarding delivery of hypothecated goods, warehouse-in

inspection and acceptance. Client should deliver the goods to appointed custody warehouse on time under bank's supervision; The proofs of warehouse-in inspection shall be hold by three parties; Logistics Corporation should issue warehouse receipt to bank right now after goods entering in inventory and clients should endorse this WR on the back.

- The provisions regarding warehouse receipt. The warehouse receipt issued by Logistics Corp is negotiable and order receipt; Bank has the right of pledge of hypothecated goods; Logistics Corp can not release goods to any other company or individual. The number of original warehouse receipt should be only one; “Notice of Releasing Goods” is the only valid proof for picking up goods; Warehouse receipt can not be reissued and report loss without written notice to warehouse; If warehouse receipt need to be hypothecated and conveyed by holder of warehouse receipt, it should be endorsed by Logistics Corp otherwise the hypothecating or transfer is invalid.
- The provisions regarding storage of goods. Logistics Corp can change custody warehouse without written consensus of pledgor and bank; Logistics Corp is responsible for storage management of goods; Normally, the storage charge and management charge should be paid by pledgor; If pledgor breaks the payment term, Logistics Corp shall have the right to retain the corresponding hypothecated goods when bank dissolves this hypothecating of particular warehouse receipt; In the event of bank disposing of hypothecated goods and using income from disposal pays off own debts, Logistics Corp has the right to priority of payment for the residual income.
- The provisions regarding the hypothecating. Plegor and bank could examine the storage situation at any time including the goods quantity, kinds and storage condition. Logistics Corp should provide truth about goods; During the

hypothecating period, the bank shall be entitled to collect the fruits derived from the pledged goods as hypothecating security; Before the date of maturity, pledgor should supplement security deposit if the market price of goods declines up to xx%(promissory percentage) of sale price.

- The provisions regarding the dissolving of warehouse receipt hypothecating. According with certain conditions bank could accept the dissolving application from pledgor and endorse the warehouse receipt on the back, then return the warehouse receipt to pledgor.
- The provisions regarding the exercising of right of pledge. If the pledgor default based on the following situations, the bank shall, in accordance with the associated provisions be entitled to convert the goods into money as payment of the debt or enjoy priority of having his claim satisfied with the proceeds of auction or sale of the pledged goods:
  - a) If the obligation is not discharged properly at its maturity;
  - b) If pledgor fails to fulfill the promise, commitment and responsibility in agreement;
  - c) If the pledgor or logistics corporation bankrupts, shutouts, disincorporates or goes into liquidation etc;
  - d) Due to irresistible force, logistics corporation fails to fulfill the responsibility of custody.
- The provisions regarding the liabilities for breach of faith. Logistics Corporation shall have the obligation to maintain the hypothecated goods in good condition. The Logistics Corporation shall compensate for the loss or destruction of or damage to the hypothecated goods resulting from his negligence in storage; Without bank's permission Logistics Corporation releases the goods to the pledgor or any third party, or releases the goods without "Notice of Releasing

Goods”, or amount of released goods exceeds the record of warehouse receipt, Logistics Corporation should compensate bank for total loss.

In fact an entire triple agreement also contains other terms, like definition, insurance, discharging order, special seal, notify, governing law, irresistible force and etc. Here I just present the basic and major part. Moreover based on different hypothecated goods, cooperative modes and three parties’ requirement the detailed provision could be diversified.

Through this typical operating mode many enterprises resolve the problem of shortage of capital. But as for logistics Corp this mode only provides a limited client source. Now more and more logistics Corp begin to cooperate with banks directly. They apply for custody warehouses appointed by bank and two parties sign “custody agreement”. The general process is banks open letter of credit for clients, and get property right, then clients deliver the goods to appointed custody warehouse. Warehouse operators inspect kind, quantity and quality of goods and finish entry in the inventory. With repaying the loan from pledgor, banks instruct warehouse operator to release goods. Based on this mode logistics Corps don't need to care about clients source as bank will provide the clients continually for logistics Corp’s warehouse. But it is probably passive to select hypothecated goods and is hard to contact with clients to provide more outstretched or value-added services.

### **3.3 PROPOSALS OF IMPROVING OPERATING MODE**

Although warehouse receipt hypothecating relieves pressure of shortage of capital provisionally for some enterprises, its own disadvantages and poor efficiency also

can not meet some clients' demand.

### **3.3.1 Improvement of Content of Financing Mode**

Actually some enterprises don't have commodity to pledge, for example, some trading companies. If still adopting original mode, these companies hardly to finance from banks. Therefore we could adopt a new mode that "first receipt and later goods" which means firstly purchasers should conclude "purchase contract" with suppliers and apply for loans from banks, then banks can open Acceptance Bill based on "purchase contract", of course bank, purchaser, supplier and logistics Corp should sign "four parties agreement of purchaser credit". Simultaneously, bank and logistics Corp sign "custody agreement" (Luo Qi & Zhu Daoli, 2002). After supplier receives payment for goods, the goods will be delivered to custody warehouse of logistics Corp and warehouse operator verifies the goods as well as notifies banks. When purchaser picks up goods, he needs to pay corresponding security to bank for goods. Whereafter warehouse receives bank's releasing instruction and release goods to purchaser. If market price of goods fall under promissory lower limit, bank has right to ask purchaser to superadd security; if purchaser pay enough money for goods, the property right of goods transferred from bank to purchaser; If purchaser don't repay all the loan before overdue, banks can dispose of these goods to offset balance of loan and custody charge. Notwithstanding some trading companies get loans without goods at first, bank may sustain huge losses in the event that the sale is not good. So the selection of hypothecated goods is very important for banks.

As far as I think, this new operating mode is an agile transfiguration of warehouse receipt hypothecating and is an improvement of content not increasing in efficiency.

### **3.3.2 Increase in Efficiency**

In the practical operation especially at present, providing loan from banks is very chary in order to avoiding bad debts because central government is trying to reduce the bad debt ratio. The examining and approving formalities of bank loans are very fussy and cost time, Therefore, the improvement of efficiency of warehouse receipt hypothecating is applied and an urgent affair.

It can be said that the poor efficiency of bank is the leading problem, from the point of view of logistics Corp it is hard to increase the efficiency of bank in China, since Chinese banks are still not flexible now. But if we can steer clear of banks, maybe the problem could be resolved. Purchasing substitution is a good way to keep away from banks. First big logistics Corp substitute for purchasers to purchase raw materials or products and gets the property right, then release goods according to the security amount, generally logistics Corp opens commercial acceptance bill to suppliers and conclude “contract of purchase” with supplier during the process of purchasing. In this plan pledgee is not bank but logistics Corp. The logistics Corp is relative independency and self-governed in contrast with banks that are governed by central bank or government. Business to Business is always efficient. At the same time the logistics Corps also can do the business of goods transportation, storage and auction etc. We always say logistics providers should extend scope of service, but the particular effect looks like not obvious. I think that is because we don’t find correct access to enterprise’s supply chain. Maybe purchasing substitution is an opening of breakthrough of real outstretched service.

In fact, some big-sized logistics Corps has engaged in this attempt, UPS absorbed American First International bank at May of 2001 and transmute it into UPS’ finance



company which provided a series of finance services that included opening letter of credit, cash exporting bill and International finance products. UPS as middleman negotiate with Wal-Mart and its tens of thousands of small suppliers in Southeast Asia, she first pay money advanced for commodities in two weeks for Wal-Mart to be paid back latter. Certainly the precondition is that UPS get the Wal-Mart's logistics businesses like custom clearance, freight forwarding and so on as well as a handsome commission charge. At last UPS that has bank and Wal-Mart make settlement by one to one.

This is absolute a good example to prove big-sized logistics corps could utilize plentiful capital to provide financing service without banks, which thereby facilitate procedures and improve the efficiency as well as make more profit. But now in China, we can hardly find a logistics company is as strong as UPS to be off bank's support, moreover being restricted by national finance policy, a company that wants to engage in finance business is no pushover, especially for stated-owned logistics Corps.

### **3.3.3 Extend Region Limit of Service**

In actual operation many clients are dispersed over big China, single warehouse hardly meet the bank's nationwide requirement. If a logistics Corp's warehouse has become the custody warehouse, its brother warehouse that belongs to the identical logistics Corp and located in other regions also should become custody warehouse as long as it suits bank's hardware qualifications. In other words parent company signs custody agreement with bank, this agreement is valid for all the subsidiary companies, which avoid repeated qualification in order to increase efficiency and extend service area.

### **3.3.4 Establish Perfect Information System Network**

Sharing information is an important part of smooth operating process. Only perfect information system network can ensure information sharing of three-parties. With the information network reaching perfection Logistics providers also need to improve and optimize its operating process. For logistics corporation information system establishment consists of two parts. One is informatization of internal management procedure. Another is a hookup of information network of logistics corporations, banks and enterprises. Internal information technology application can optimize logistics network and service system. As far as warehouse receipt hypothecating IT application is able to reduce the human mistakes and increase efficiency, its most obvious advantage is to make better communication and information sharing with clients and banks, help logistics Corps and banks to avoid risks, as well as facilitate bank's custody of hypothecated goods. For example when inventory level or warehouse receipt value decrease to a governing criteria, bank, warehouse and pledgor right now know this information at the same time through the information network and WMS. At the first time information network conveys it to pledgor and asks for replenishment.

### **3.3.5 Set Normative Business Criterion of Operating Mode**

Warehouse receipt hypothecating has become an essential financing mode and is an important component of value-added service for logistics corporations. However, Logistics corporations not only bear risks and pay much operating cost, but also have to invest heavily in establishment of information system network in China, all of which limit some logistics Corps' participating in, especially for some small-sized or

medium logistics Corps. Setting corresponding simulative policy that permits logistics providers to obtain value-added income with a proper proportion, banks or clients could pay for this charge of service. Generally, if banks pay for this charge logistics Corps will do better duty of custody. In practical experience at present the charge of logistics Corps is not normative, some charges are based on loan value, some are based on custody quantity. Consequently normative business regulations regardless of about operating process or charge criterion, out of question, must be one of the great bulwarks of this business development.

In conclusion, in this chapter, the typical process is introduced. It has been widely adopt by Chinese banks, small-sized enterprises and logistics Corps. We mainly discuss the improvement measures from operating process to operating mode and special methods. From the present situation the increase in efficiency of bank is pivotal. But in current credit circumstances, banks have to be wary of various financing claims, it's hard to be improved obviously. Now we need to focus on other two parties—enterprises and logistics Corp, in China the logistics Corps that are able to engage in the business of warehouse receipt hypothecating are most of big-sized companies. Big-sized companies are normally state-owned Corps that may be limited by government and policy, but privately-run Corps don't have enough scale to do it. It looks like a paradox. Maybe only if powerful foreign banks and logistics companies entering into China, Chinese government and state-owned Corps really realize that what they should do.

## **CHAPTER 4**

### **RISK MANAGEMENT OF WAREHOUSE RECEIPT HYPOTHECATING**

#### **4.1 INTRODUCTORY REMARKS**

Warehouse receipt hypothecating is a rising financing product with characteristics of triplex winning. But as to every business, risks and benefit coexist. Risks should be fully realized and understood in order to taken some pointed measures to avert risk and boost the healthy development.

From the actual situation and operating mode, the risk of warehouse receipt hypothecating consists of two parts. One is common risk and another is special risk. Common risks mean risks that lie in every business, which consist of risks of clients credit, interior tricks, selection of hypothecated goods, market price fluctuating and operating process. Special risks mean warehouse receipt risk for pledge of rights and inventory control<sup>3</sup> risk

In general, each party can avert or control above risks by standardized management and new management tool. Healthy development could make more corporation benefit from it.

#### **4.2 RISKS ANALYSIS AND MANAGEMENT**

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<sup>3</sup> Inventory control includes goods' quantity control and quality control.

#### 4.2.1 Common Risks

- a) Credit standing risk. The client credit risk is a major reason of financing difficulty. The operating competence, goods quantity and the validity of source are also the potential risks for logistics Corps and banks. While pledgors picking up goods circularly, the unqualified hypothecated goods may be replenished, which lead to inferior hypothecated goods in custody warehouse; the credit risks come from co-cheating made by bank and clients for logistics Corps and by client and logistics Corps for bank as well. Therefore banks and logistic companies should pay more attention to clients' managed capability and credit status, normally clients or pledgors' growth rate of prime operating revenue should be larger than the average for industry, or primary liquidity level ratio is less than 50%(Zhang E & Feng Gengzhong, 2003, 29-31). Besides economic capability, better credit standing is an essential condition. We should focus on client's history of repaying debts and repaying performance. Logistics Corp is not able to cooperate with an enterprise that has disrepute.
- b) Interior trick risk. Interior employees of banks and logistics Corps shark up hypothecated goods, three parties will sustain huge losses. Using computer management system to help operating process standardization, transparency and traceability is an efficient measure to reduce artificial factors.
- c) Selection risk of hypothecated goods. Not all the commodities adapt to being pledged. The prices of many goods are apt to fluctuate widely. Of course, price rising is good for banks and logistics Corps. In case of price fall the amount of financing is higher than value of hypothecated goods, the banks might face the

risk that pledgors repudiate debts. Normally, agreement provides that if the market price falls down up to 90%( or appointed ratio) of original assessment, banks or logistics companies could require pledgors to replenish inventory. Simultaneously, hypothecated goods should try to be versatile and easy to auction. In addition the validity of hypothecated goods should be more emphasized, pledgors should have corresponding property right, avoiding some goods that are in dispute and unable to do right of pledge or smuggling goods to become hypothecated goods.

- d) Risk of operating process. Warehouse receipt hypothecating involves three parties, Cooperation of logistics providers and banks in harmony is very significant, no matter of interior misoperation or two parties' linkup mistake, the operating process would be influenced badly. So an advanced WMS (warehouse management system) and perfect management regime are the most efficient tool and method to avert operating risks, especially warehouse's computer network should link up the bank's network, which ensures information sharing.

#### **4.2.2 Special Risks**

- a) Warehouse receipt risk. Warehouse receipt is a kind of certificate for hypothecating loan and claiming the warehousing goods, securities and documents of title. Now various logistics corporations design different formats of warehouse receipt themselves. The requirements are not standard. Even some warehouses issue entry document as hypothecating voucher. In fact, Contract Law of the People's Republic of China<sup>4</sup> in which Article 386 provides that a

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<sup>4</sup> The Contract Law of the People's Republic of China, adopted at the 2nd Meeting of the Standing Committee of the ninth National People's Congress of the People's Republic of China on March 15, 1999, is hereby promulgated and shall enter into force as of October 1, 1999

warehouse receipt shall contain the following items:

- (1) title or name and domicile of the storing party;
- (2) category, quantity, quality, package, number of pieces and marks of the warehousing goods;
- (3) standards of spoilage of the warehousing goods;
- (4) place of storage;
- (5) time period of storage;
- (6) warehousing fee;
- (7) where the warehousing goods have been insured, the amount and period time of the insurance and the title of the insurance company; and
- (8) name of the person who issues the warehouse voucher, the place and the date of issuance

Although the contents of warehouse receipts issued by various logistics companies are identical with provisions of “contract law”, format is not uniform. It is obvious that standard format and content play a vital role for risk aversion.

- b) Inventory (quantity and quality) control risk. Logistics companies not only need to assume custody responsibility but also control inventory at a regulated level. When inventory level drops down to lower limit, Logistics Corporation should let bank know at first time, then restrict outbound and warn pledgors to replenish goods. Because once the inventory of hypothecated goods is much less than closing line and pledgors fail to replenish goods and superadd security money, the bank and logistics company must suffer losses. Therefore, setting up a series of quality indicators as criteria to contrast against practical situation is absolutely a feasible and effective method. We will discuss it in the following

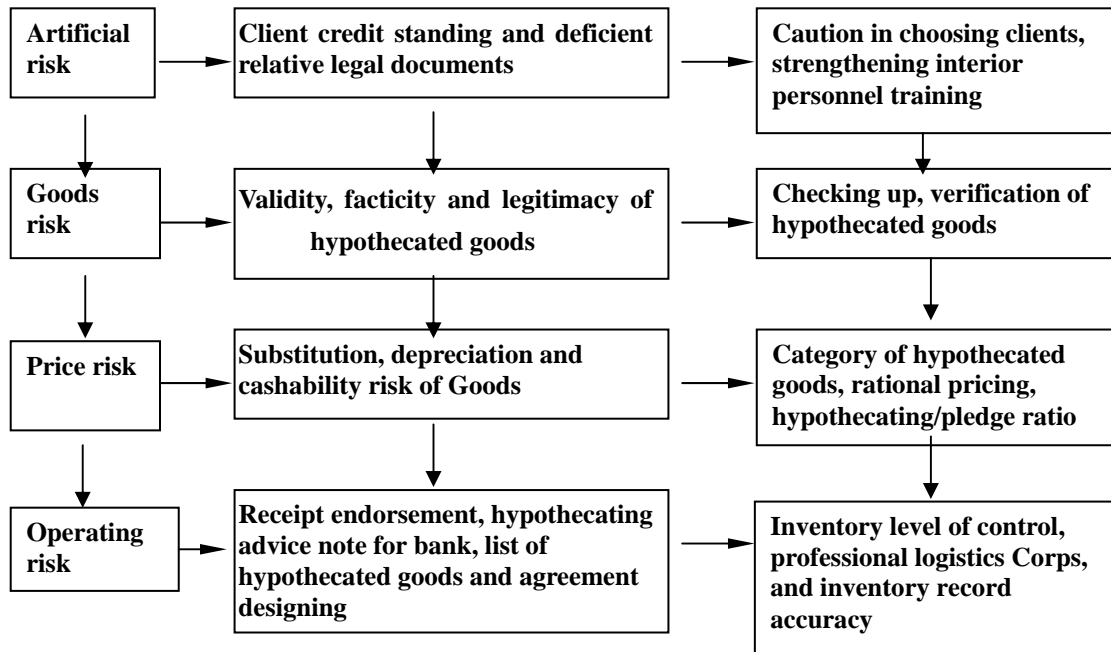
chapter.

### **4.3 RISK AVERSION MODEL**

With regard to the various risks banks and logistics Corps should take measures to avert and control risks. The very core of operating process of warehouse receipt hypothecating is risk aversion. Rigorous countermeasures for risks and quit procedure should be designed by cooperation of banks and logistics providers to ensure three-parties winning together. Matrix risk aversion model is a comprehensive and efficient model. It eliminates disadvantages of some models of risk aversion, like unilateral, partial, point and line control, at the same time establishes matrix control system that uses surface to cover points and lines.

Figure 4.1 shows a comprehensive and effective process of risk aversion. Integrated control process covers all aspects of risk. The risks can be controlled at a very low level when applying this matrix model to actual operating process.





**Figure 4.1 Matrix risk aversion model**

#### **4.4 CONCLUDING REMARKS**

In this chapter, the common risks and special risks of warehouse receipt hypothecating are discussed. Most risks like clients credit standing risk, warehouse receipt risk and operation process risk are more or less in contact with credit. Integration of credit should be the first thing before starting operation. Three parties who trust each other are likely to be more successful at credit integration in which credit information of three parties is shared and most risks in this present stage are isolated from practical operation. Obviously, logistics Corps as middlemen actually has become a kind of service platform that connect banks with enterprises. When operation steps into actual stage, matrix risk aversion model will supervise, control,

and verify the whole operating process to try to ensure perfectly safe. In fact, warehouse receipt hypothecating is a low-risk financing mode for involved three parties if taking proper measures of risk precaution and management according to past experience.

**CHAPTER 5**  
**SETTING EVALUATING INDICATORS AND VALUE AT RISK (VAR)**  
**MODEL ANALYSIS**

**5.1 SETTING EVALUATING INDICATORS**

Based on the good prospect of warehouse receipt hypothecating and potential problems that we have analyzed in chapter 4, furthermore risk is invisible. It is necessary to use qualitative analysis and quantitative analysis to judge and analyze the potential risks. The following three indicators designed reflect that whether the hypothecating rate is rational from different sides. The first indicator is discussed from the point of view of credit position. The second indicator shows the security of confirmation of hypothecating rate from the point of view of probability of default. The third indicator indicates the reality of confirmation of hypothecating rate<sup>5</sup> from the point of view of warning line level (Xu Yali, 2004, 27-28).

**5.1.1 Principal Spread, Closing Line<sup>6</sup> Spread and Warning Line<sup>7</sup> Spread**

The relative distance of the lowest price and level of control means the average

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<sup>5</sup> Hypothecating rate means a ratio of loan amount to confirmed price of warehouse receipt.

<sup>6</sup> The closing line is a level of control or management criterion, when price of warehouse receipt decrease to closing line and pledgor failed to replenish inventory and additional security. Bank or warehouse operator could dispose hypothecated goods and make liquidating sale or auction to repay the balance loans.

<sup>7</sup> The warning line is a level of control or management criterion, when price of warehouse receipt decrease to waning line, bank or warehouse operator need to notify pledgor to replenish inventory or superadd risk security.

distance between the lowest market price of warehouse receipt and various values of hypothecated goods during the period of loan, these relative distances indicate that whether the distance between the goods price's variety and management level of loan is appropriate. And the standard deviation of average distance reflects the stability of result of confirmation method for hypothecating rate, a good confirmation method for hypothecating rate should produce less distance between various simulative loans of warehouse receipt hypothecating and level of control. Hypotheses: the relative distance of various hypothecated loan and level of control is mutual independence and standard normal distribution, the relative distance is the corresponding quantile.

We set the difference of the lowest market price of unit hypothecated goods and amount of hypothecating loan per unit goods as principal spread. A principal spread can calculate regarding each given loan of warehouse receipt hypothecating and period of loan. We need to make processing for the principal spread in order to compare different principal spreads in light of various starting times and price levels, the processing result is also principal spread signifying

$D_b =$

$$\frac{\text{lowest market price per unit goods} - \text{amount of hypothecating loan per unit goods}}{\text{market price of unit goods at starting time of loan}}$$

Similarly, we can get the closing line spread-- $D_p$  and warning line spread— $D_j$ .

$D_p =$

$$\frac{\text{lowest market price per unit goods} - \text{corresponding closing line to hypothecating loan per unit goods}}{\text{market price of unit goods at starting time of loan}}$$

$D_j =$

$$\frac{\text{lowest market price per unit goods} - \text{corresponding warning line to hypothecating loan per unit goods}}{\text{market price of unit goods at starting time of loan}}$$

In the process of empirical research on market, we can get practicable hypothecating loans for each warehouse receipt respectively in a certain period of loan. For each hypothecating loan we have a principal spread, closing line spread and warning line spread. For each warehouse receipt we can have several simulative hypothecating loans (create a new. simulative hypothecating loan at different starting time). We could take statistics for all the simulative hypothecating loans given by calculable warehouse receipts in light of the same term of loan to calculate the means and standard deviations of principal spread, closing line spread and warning line spread.

### 5.1.2 Principal Ratio, Closing Line Ratio and Warning Line Ratio

The percentage between the number of days during which the market price of hypothecated goods is lower than closing line and the actual trading days of this loan is expressed as closing line ratio--Rp. The variance of this percentage should be as small as possible. The principal ratio--Rb equals the number of days during which the market price per unit goods is lower than the amount of loan per unit goods for each hypothecated warehouse receipt divided by the number of trading days in term of loan. Similarly, we also can get warning line ratio--Rj by using corresponding value of warning line to each unit goods.

Rb=

$$Rb = \frac{\text{number of days during which market price of unit goods is lower than amount of loan per unit goods}}{\text{actual trading days}}$$

$$Rp = \frac{\text{number of days during which the market price of unit goods is lower than closing line}}{\text{actual trading days}}$$

R<sub>j</sub>=

$$\frac{\text{number of days during which the market price of unit goods is lower than warning line}}{\text{actual trading days}}$$

In the empirical study, we can get all practicable hypothecating loans for each warehouse receipt respectively in a certain period of loan. For each hypothecating loan we have a principal ratio, closing line ratio and warning line ratio. For each warehouse receipt we can have several simulative hypothecating loans (be able to create a new. simulative hypothecating loan at different starting time). We could take statistics for all the simulative hypothecating loans given by calculable warehouse receipts in light of the same term of loan to calculate the means and standard deviations of principal ratio, closing line ratio and warning line ratio.

Simultaneously, we set the number of hypothecating loans of which unit hypothecated goods' the lowest market prices is lower than the closing line and warning line as NO<sub>p</sub> and NO<sub>j</sub> within all the calculable samples of loan. The NO<sub>j</sub> shows that how many hypothecating loans with an appointed hypothecating rate, in a particular period, need to replenish the inventory when the market price of hypothecated goods under the warning line and the NO<sub>p</sub> generally indicates that what proportion of hypothecating loan need to close out if no replenishment timely for an appointed hypothecating rate.

The NO<sub>p</sub> divided by total number of simulative hypothecating loans equal the incidence rate of closing-out for the particular appointed hypothecating rate. The NO<sub>j</sub> divided by total number of simulative hypothecating loans equal the incidence rate of warning for the particular appointed hypothecating rate.

With regard to the above setting indicators to evaluate hypothecating rate we can

create the simulative hypothecating loans using actual trading data in market to compare and analyze the diverse confirmation methods of hypothecating rate. The different methods of calculating VAR can be sift by using current several kinds of loan of warehouse receipt hypothecating to find out the suitable VAR confirmation model of hypothecating rate for loans of warehouse receipt hypothecating in China market.

## **5.2 VAR QUANTITATIVE ANALYSIS FOR EVALUATING INDICATORS**

### **5.2.1 VAR Model Analysis to Confirm Hypothecating Rate**

VAR measures probabilistically the worst expected loss of an asset or portfolio under a condition of normal market circumstance over a specific time interval with a given level of confidence. Another way to describe it is that VAR is the lowest quantile of the potential losses that can occur within a given portfolio during a specified time period (Simon Benninga & Zvi Wiener, 1998). A VAR statistic consists of three important components: a time period, a confidence level and an amount of loss (or loss percentage).

Before confirm the hypothecating rate we need to estimate the VAR of hypothecated warehouse receipt. VAR is used to evaluate the risk value of warehouse receipt hypothecated at a given confidence level. In order to find out a best method of calculating VAR that fit for current Chinese warehouse receipt hypothecating market, Zhongguo bank compares and analyzes several common methods including “The Variance-Covariance Method, Historical Method and Monte Carlo Simulation”. A few groups of parameters are applied to each method. Zhongguo bank chooses 0.95,

0.97,0.98 and 0.99 as the index loss factor for Variance-Covariance Method and adopts 250 days as trading period for historical method.

Zhongguo bank regulates an upper limit of 60% for hypothecating rate in their “management procedure of warehouse receipt hypothecating”. Simultaneously, Zhongguo bank puts forward various evaluating indicators of simulative hypothecating loan with a fixed hypothecating rate of 60%. Based on the evaluating indicator system mentioned above, the comparison and analysis of general representation of three VAR methods with regard to hypothecating rate confirmation can reveal a general result that can be used as an exact and stable VAR method to confirm the hypothecating rate in the model. A consistent result for hypothecating loans of different periods can be raised by applying VAR method to confirming the hypothecating rate of warehouse receipt. Zhongguo bank makes use of VAR model to estimate the risk of loan of warehouse receipt hypothecating in order to make a correct decision of loan.

Table 5.1 shows that the loss factors of upwards of 0.95 have subliminal effect on evaluating indicators of shorter periods of loan while using Variance-Covariance Method. However, for longer periods of loans the general effect of larger loss factors on results is obvious. Perfect results can be obtained by using large sample data of many years and recent diversification of market price has no effect upon price change of long period. This result is similar with other researches’ result meaning that it’s hard to forecast the price fluctuation of warehouse receipt for long period hypothecated loans, so not obvious improvement of calculating result will be raised by evaluating model with diverse frequently fluctuation. Therefore the homoscedastic hypotheses is relative rational for longer term of loan. According to the empirical results of hypothecating loans of which period of time is from one to



four months we know that although changing of loss factor has little effect on results, the result is much better when the loss factor is 0.98. Herein the function of loss factor not only attribute to heteroscedasticity in term of loan but also to market development change itself.

Due to China has a short history of warehouse receipt hypothecating even with breaks, the data of not long period of time used in this model, the findings of research maybe have limitation. We can find in the following results based on year to calculate that the results calculated using the same method in different years have much diversity to some extent. Fortunately, the results between different methods have relative consistency.

The results in table 5.1 indicate the number of samples collected is very limited, even though using repeated samples the variety of scene represented directly by history data is very limited. So the historical method is not suitable for Chinese market as it's not stable despite its good representative in VAR evaluating model.

As for the simulative loans with fixed hypothecating rate, the rate is lower for the shorter period of time loans owing to neglect of variety of period of loan. But the hypothecating rate is higher for the longer period of time loans. For example the NOp with given hypothecating rate of 60% is as 2 times as the number with VAR method for loan of one month. When the period time of loan reaches 4 months, the NOp with given rate is almost 4 times more than the VAR method.

### **5.2.2 Explanation of VAR Model Application**

Zhongguo bank makes an empirical analysis of the sample for every period of loan

of the warehouse receipt hypothecating (various periods of loan comprise one, two, three, four and six months). In order to reduce the computational complexity, Zhongguo bank collects sample data every five trading days instead of every day. According to the period time of loan and different requirement of sampling of model the different historical data are collected, for instance, the number of data collected for the one-month hypothecating loan is less than the six months.

In the following calculation Zhongguo bank requires that the number of samples of each simulative loan of warehouse receipt hypothecating is not less than 250 at least. When evaluating the parameters of model we apply the repeated sample in order to enlarge the sample size for precision in calculation. The price differences between the lowest price and principal of loan, closing line and warning line respectively are calculated at a 0.99 confidence level and compute the empirical distribution of price difference as well as the means and standard deviations of principal spread, closing line spread and warning line spread for all the calculable loans of warehouse receipt hypothecating in corresponding period of time. In the given period of time of loans the number and percentage of goods price, which is lower than the warning line, closing line and principal are calculated in the period of time of loans based on the hypothecating rate given by this model.

**Table 5.1 The results of various evaluating indicators of loan of warehouse receipt hypothecating with statistics**

<b>The calculated results of evaluating indicators for one-month loan</b>					
<b>Period</b>	<b>Sample size</b>	<b>Mean of principal spread</b>	<b>Standard deviation of principal spread</b>	<b>Mean of principal ratio</b>	<b>Standard deviation of principal ratio</b>

1997	5273	0.39426	0.08092	0	0
1998	5226	0.36888	0.09709	0.00091	0.06587
1999	14716	0.35783	0.07942	0	0
2000	17009	0.36998	0.07406	0.00476	0.45748
Total	42224	0.36864		0.00203	
<b>Period</b>	<b>Mean of closing line spread</b>	<b>Standard deviation of closing line spread</b>	<b>Mean of closing line ratio</b>	<b>Standard deviation of closing line ratio</b>	<b>Nop</b>
1997	0.28299	0.09256	0.03703	1.15599	7
1998	0.25786	0.10646	0.0492	0.79994	26
1999	0.24237	0.08532	0.0508	0.80578	97
2000	0.25619	0.08268	0.01484	0.80064	8
Total	0.2549		0.0344		138
<b>Period</b>	<b>Mean of warning line spread</b>	<b>Standard deviation of warning line spread</b>	<b>Mean of warning line ratio</b>	<b>Standard deviation of warning line ratio</b>	<b>Noj</b>
1997	0.22734	0.09867	0.08579	15	8
1998	0.20235	0.35537	2.9217	16	6
1999	0.18463	0.08848	0.3731	2.90686	420
2000	0.19929	0.08725	0.04787	1.21713	56
Total	0.1981		0.20401		490
<b>The calculated results of evaluating indicators for two-month loan</b>					
<b>Period</b>	<b>Sample size</b>	<b>Mean of principal spread</b>	<b>Standard deviation of principal spread</b>	<b>Mean of principal ratio</b>	<b>Standard deviation of principal ratio</b>
1997	4916	0.42332	0.1079	0.00048	0.03395
1998	3749	0.38664	0.13269	0.00056	0.03643
1999	13210	0.36763	0.11537	0.0018	0.08284
2000	15351	0.38887	0.1099	0.00682	0.54689
Total	37752	0.38567		0.00353	
<b>Period</b>	<b>Mean of closing line spread</b>	<b>Standard deviation of closing line spread</b>	<b>Mean of closing line ratio</b>	<b>Standard deviation of closing line ratio</b>	<b>Nop</b>
1997	0.31973	0.12521	0.09925	2.37063	13
1998	0.28694	0.14709	0.17273	1.89272	53
1999	0.25965	0.12589	0.13698	1.37715	260

2000	0.12467	0.03909	1.34666	30	7
Total	0.2803		0.09631		333
<b>Period</b>	<b>Mean of warning line spread</b>	<b>Standard deviation of warning line spread</b>	<b>Mean of warning line ratio</b>	<b>Standard deviation of warning line ratio</b>	<b>Noj</b>
1997	0.26792	0.4472	0.18929	3.06342	32
1998	0.23709	0.15481	0.66865	4.4914927	181
1999	0.20566	0.13148	0.6751	3.92636	759
2000	0.23079	0.13234	0.13308	1.96762	170
Total	0.2275		0.39071		1142
<b>The calculated results of evaluating indicators for three-month loan</b>					
<b>Period</b>	<b>Sample size</b>	<b>Mean of principal spread</b>	<b>Standard deviation of principal spread</b>	<b>Mean of principal ratio</b>	<b>Standard deviation of principal ratio</b>
1997	4555	0.4472	0.12124	0.00558	0.20498
1998	3749	0.39982	0.1563	0.02583	0.73148
1999	11789	0.37641	0.13993	0.00364	0.11962
2000	13757	0.41187	0.13185	0.00427	0.32505
Total	33850	0.40294		0.00662	
<b>Period</b>	<b>Mean of closing line spread</b>	<b>Standard deviation of closing line spread</b>	<b>Mean of closing line ratio</b>	<b>Standard deviation of closing line ratio</b>	<b>Nop</b>
1997	0.34905	0.14179	0.11709	2.70318	11
1998	0.30899	0.17319	0.36962	3.02762	98
1999	0.27514	0.15296	0.20668	1.76529	372
2000	0.31372	0.15014	0.05919	1.30464	71
Total	0.3045		0.15273		552
<b>Period</b>	<b>Mean of warning line spread</b>	<b>Standard deviation of warning line spread</b>	<b>Mean of warning line ratio</b>	<b>Standard deviation of warning line ratio</b>	<b>Noj</b>
1997	0.29997	0.15238	0.18957	3.37881	31
1998	0.26357	0.18221	0.97253	5.59089	200
1999	0.2245	0.15988	0.83357	4.38131	921
2000	0.26464	0.15959	0.22349	2.37932	281
Total	0.2553		0.51436		1433
<b>The calculated results of evaluating indicators for four-month loan</b>					

Period	Sample size	Mean of principal spread	Standard deviation of principal spread	Mean of principal ratio	Standard deviation of principal ratio
1997	4176	0.46714	0.13206	0.00969	0.30815
1998	3240	0.41531	0.16329	0.04189	1.09532
1999	10424	0.3781	0.15404	0.00354	0.9819
2000	12354	0.43863	0.14323	0.00549	0.29812
Total	30194	0.41917		0.0093	
Period	Mean of closing line spread	Standard deviation of closing line spread	Mean of closing line ratio	Standard deviation of closing line ratio	Nop
1997	0.37391	0.15501	0.12144	2.85802	13
1998	0.33091	0.18022	0.42622	3.48514	88
1999	0.28247	0.16895	0.28597	2.36405	379
2000	0.34657	0.16366	0.06957	1.32835	81
Total	0.3265		0.18972		561
Period	Mean of warning line spread	Standard deviation of warning line spread	Mean of warning line ratio	Standard deviation of warning line ratio	Noj
1997	0.32729	0.16681	0.18958	3.48511	25
1998	0.2887	0.18936	0.99317	5.74532	179
1999	0.23465	0.17684	0.98011	4.99597	894
2000	0.30054	0.17424	0.22356	2.38434	247
Total	0.2802		0.56263		1345
The calculated results of evaluating indicators for six-month loan					
Period	Sample size	Mean of principal spread	Standard deviation of principal spread	Mean of principal ratio	Standard deviation of principal ratio
1997	3331	0.50157	0.14715	0.4575	1.24988
1998	2274	0.44316	0.18382	0.08062	1.32943
1999	2651	0.38067	0.1571	0.02106	0.69779
2000	9621	0.46772	0.1495	0.00297	0.19752
Total	17877	0.44109		0.02297	
Period	Mean of closing line spread	Standard deviation of closing line	Mean of closing line ratio	Standard deviation of	Nop

		spread		closing line ratio	
1997	0.41423	0.17402	0.14725	3.22591	13
1998	0.3702	0.2027	0.52701	4.3291	79
1999	0.29184	0.17265	0.34066	3.103445	291
2000	0.38127	0.7095	0.04595	0.95457	59
Total	0.3551		0.20708		442
Period	Mean of warning line spread	Standard deviation of warning line spread	Mean of warning line ratio	Standard deviation of warning line ratio	Noj
1997	0.37057	0.18775	0.2111	3.60015	25
1998	0.33372	0.21299	1.08787	6.24641	131
1999	0.24742	0.18093	1.05381	5.95026	626
2000	0.33804	0.18202	0.14057	1.75204	159
Total	0.312		0.55043		941

Source: Technical report of hypothecating loan (2001).Zhongguo bank

### 5.2.3 Indicators Measure of Principal Spread, Closing Line Spread and Warning Line Spread in VAR Model

It is shown in table 5.1 that the statistical characteristic of warehouse receipt hypothecating in China is that the changing trends of principal spread, closing line spread and warning line spread are basically consistent in each year by using VAR methods. The mean decreases with year along with the period of loan increasing, the means of 1999 become lower than the 2000 and the gap is more and more distinct, accordingly, the standard deviation decrease with year. Notwithstanding the means of 2000 in longer period of loans are more than 1999, standard deviations become decreasing instead of increasing. The standard deviations of 1997 decline very quickly with the period time of loans shortening. The numbers of various indicators that underlie the level of control are more than other years as means of three sorts of spread are small in 1999. In 2000 the gaps between the lowest market price of

simulative hypothecating loans and level of control are widened by the unstable market represented by warehouse receipt hypothecating, moreover the chance that the lowest market prices are lower than closing line and warning line reduce greatly as well.

#### **5.2.4 Indicators Measure of Principal Ratio, Closing Line Ratio and Warning Line Ratio in VAR Model**

Zhongguo bank presented a general statistic result regarding NOP and NOj for the risk characteristic of data of warehouse receipt hypothecating loan between the year of 1997 and 2000 in Table 5.2.

The calculation in Table 5.2 attaches some restrictive conditions i.e. some hypothecating loans to which the prices of hypothecated goods that increase so fast and so slowly or goods' prices falling sharply arose by unnormal market circle pertaining, are all discarded.

**Table 5.2 Percentage of NOP and Noj of hypothecating loans of different terms under restrictive conditions**

<b>Period</b>	<b>One month</b>	<b>Two month</b>	<b>Three month</b>	<b>Four month</b>	<b>Six month</b>
<b>Total number of loan</b>	42224	37752	33850	30194	22877
<b>NOj</b>	634	1142	1433	1345	941
<b>Nop</b>	138	357	552	561	442
<b>Percentage of NOj</b>	1.501%	3.025%	4.233%	4.454%	3.271%
<b>Percentage of Nop</b>	0.327%	0.945%	1.631%	1.860%	1.932%

In order to compare and test the validity of restrictive conditions regulated by the

“management procedure of warehouse receipt hypothecating”, Zhongguo bank presents a statistic result without any restrictive conditions in Table 5.3 for all the hypothecating loans.

**Table 5.3 Percentage of NOp and Noj of hypothecating loans of different terms without restrictive conditions**

<b>Period</b>	<b>One month</b>	<b>Two month</b>	<b>Three month</b>	<b>Four month</b>	<b>Six month</b>
<b>Total number of loan</b>	79991	71529	63288	55391	39706
<b>NOj</b>	1674	2569	3002	2863	1984
<b>Nop</b>	439	912	1308	1319	1040
<b>Percentage of NOj</b>	2.093%	3.592%	4.743%	5.169%	4.997%
<b>Percentage of Nop</b>	0.549%	1.275%	2.067%	2.381%	2.619%

It is obvious that in table 5.2 and table 5.3 the number of loans of which the prices lower than the closing line increase constantly with the period of loans lengthening; the number of loans of which the prices lower than the warning line increase constantly with the period of loans lengthening, at the fourth month reaching the highest point and a little bit decrease at the sixth month.

Although the changing trend under above two conditions are identical, the number of loans of which the price lower than the closing line and warning line decrease obviously under restrictive condition, especially for the hypothecating loans which have periods of four and above months. Consequently, the restrictive condition that is regulated by the related management procedure in respect of reducing the integral risk of hypothecating loans is effective distinctly.

In conclusion, it can be said that it's quite reasonable to evaluate the given



hypothecating rate through position of closing line and warning line and an integral and objective expression of risk of hypothecating loan has been shown using VAR model. From above tables we can find these indicators are all close to normal distribution. VAR model gives us an appropriate risktaking level to measure risk of hypothecating loan rationally.

This chapter shows the restrictive condition of “management procedure of warehouse receipt hypothecating” is actually effective for hypothecating loan. The results of confirming hypothecating rate for different period times of loan are more identical in VAR model, which help decision maker to adjust hypothecating rate properly and control risks. Nevertheless as for the particular hypothecating loan at the same time bank need to consider enterprise’s finance status and credit standing.

## **CHAPTER 6**

### **SUMMARY AND CONCLUSION**

The warehouse receipt hypothecating as a financing mode and logistics service is still a relatively new phenomenon in Chinese finance market even though the concept has its roots steeped in history in foreign countries. Now some financing modes adopted by Chinese banks can't meet small-sized and medium enterprises' financing demand and the entrance of some bonding companies has not solved the problems to its very foundation. The inventory of enterprises tie up much fluid working funds, so as for the small-sized enterprises the dearest need is to tap this kind of inventory, raise utilization ratio of capital and speed up of turnover of capital. In this business of warehouse receipt hypothecating involving relationship of three-parties, logistics provider as middleman who gives custody of hypothecating goods help banks avoid some finance risks. It is obvious that warehouse receipt hypothecating is more suitable for Chinese market status in which small-sized it's hard for enterprises to get loans and for banks to provide loans. It can effectively resolve the contradiction of banks and enterprises and problem of incomplete credit system in a long period of time to

In this dissertation, an attempt has been made to examine the theoretical precepts and practical operation. In preliminary terms I focus on the operating situation in foreign countries and China, and analyze why government supports and bank, small-sized enterprises and logistics Corp are willing to operate this business of warehouse

receipt hypothecating. Facts indicate that it benefits for three parties with flexible characteristics. Simultaneously a survey and review of the literature tell us scholars pay more attention to theoretical study of warehouse receipt hypothecating itself and neglect its practical problems. This dissertation at the beginning analyzes three parties' bottleneck problems of operating this business respectively. An appropriate analysis for problems can help us to grasp its essentials and take measures to eliminate bottlenecks and facilitate the development of warehouse receipt hypothecating.

Subsequence of this dissertation is an attempt to take a review of literature. The result indicates that in China development of practice is faster than academic research and Chinese scholars are trying their best to fill some academic gaps regarding warehouse receipt hypothecating in order to support development of practice. Third-party logistics corporations as middlemen resolve the problem of information asymmetry to a certain extent and groups small-sized enterprises in order to increase the volume of snip business and decrease the operating cost of banks. Therefore the participation of third-party logistics provider is the pivotal issue. Then an effort has been made to analyze the advantages and disadvantages of warehouse receipt hypothecating. From the points of utilization ratio, risk aversion and professional custody, various advantages have been presented obviously. That's reason why numerous small-sized enterprises, some banks and logistics Corps would like to adopt it. Too, as a new business in China its disadvantages deserve to be carefully weighed, as the dissertation mentioned, legal problem, agreement designing problem and various operating risks could retard the progress of warehouse receipt hypothecating and should catch our attention. According to the next analysis of comparison with other similar financing modes, warehouse receipt still shows its predominance as a new business in despite of its drawbacks or risks.

Warehouse receipt hypothecating as it stands in the arena of financing mode and logistics service has formed a basic standard operating procedure, chapter 3 introduces and analyzes a typical operating mode and triple agreement in detail, which indicate that each participant possesses definite duties and obligations regardless of banks, pledgors, and logistics providers. A survey and review of the literatures indicate that much of discussion regarding new modes of warehouse receipt hypothecating advanced by scholars and practitioners, in fact, always revolve around core of warehouse receipt hypothecating i.e. pledge of movables and rights. As far as I think other new operating modes are just an extending in term of form and some details. In the last part of this chapter is an attempt to make suggestions for improvement of operating mode that includes particular procedure, efficiency, service area, information system and criterion. But these are only a part of many improvements that need scholars and operators to offer and optimize constantly.

In chapter 4, more attention has been paid to a very significant issue of risk management. As a financing mode banks indeed care security of loan. They always want to provide a loan with as less risk as possible. Better understanding and analysis of risks of warehouse receipt hypothecating can help three-parties participants to prevent and control risks. The dissertation divides the risks into two types i.e. common risk and special risk. More deep analysis has been made for two types of risks respectively. Hereinto credit risk is still an essential risk issue in China market due to unperfected social credit system. However, raising the problem is not our target, only resolving problem is ultimate objective. Based on analysis results and practical experiences, a matrix risk aversion model is put forward. Its biggest merit is covering nearly all keypoints of problem. The risks must be controlled at a very low level as long as banks and warehouse operator could carry out according to

requirements of matrix model.

With regard to management of warehouse receipt hypothecating a certain quantitative analysis is also absolutely necessarily besides above qualitative analysis. First setting evaluating indicators and then using prevailing VAR theoretics in The West to analyze evaluating indicators based on data pertaining to a bank. At last reaching a conclusion that the constraint regarding hypothecating rate prescribed in “management procedure of warehouse receipt hypothecating” is absolutely effective. Applying VAR method to confirming the hypothecating rate of warehouse receipt can raise a consistent result for hypothecating loans of different periods, as well as, can help banks and logistics Corps adjust criterion and control risk timely.

In conclusion, notwithstanding there are still some operating problems that retard the progress of warehouse receipt hypothecating, favorable cooperation of banks and logistics Corps, perfect management procedure, standard triple agreement and credit system can promote the development of business as well. Warehouse receipt hypothecating, as a financing mode and logistics service, will play a constructive role in future Chinese market and become one of the greatest financing channels.

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## **Appendix A**

### **An extract of Guaranty Law of the People's Republic of China**

#### **Chapter 4 Pledge**

##### **Section 1 Pledge of Movable**

Article 63. Pledge of movables as used in this Law means that the debtor or a third party transfers the possession of his movables to the creditor as a security for debt. If the debtor defaults, the creditor shall, in accordance with the provisions of this Law, be entitled to convert the property into money as payment of the debt or enjoy priority of having his claim satisfied with the proceeds of auction or sale of the pledged property. The debtor or the third party mentioned in the preceding paragraph shall be the pledgor, the creditor shall be the pledgee, and the movables transferred shall be the pledged property.

Article 64. A pledgor and a pledgee shall conclude a pledge contract in writing. A pledge contract shall become effective upon the delivery of the pledged property to the possession of the pledgee.

Article 65. A pledge contract shall include the following particulars: (1) the kind and amount of the principal debt secured; (2) the time limit for the debtor to perform his obligation; (3) the name, quantity, quality and condition of the pledged property; (4) the scope of the guaranty of pledge; (5) the time for delivering the pledged property; and (6) other matters the parties deem necessary to include in the contract. If a

pledge contract does not contain all the particulars specified in the preceding paragraph, the omissions may be added by amendment.

Article 66. A pledgor and a pledgee may not stipulate in the contract that ownership of the pledged property shall be transferred to the pledgee if the obligation is not discharged at its maturity.

Article 67. The scope of guaranty of pledge includes the principal claim and the interest thereof, default fine, the compensation for damage, the storage charges and the cost of enforcing the right of the pledge. If otherwise provided for in the pledge contract, the provisions there shall apply.

Article 68. The pledgee shall be entitled to collect the fruits derived from the pledged property. If otherwise provided for in the pledge contract, the provisions there shall apply. The fruits mentioned in the preceding paragraph shall first be used to pay the expenses for collecting the fruits.

Article 69. The pledgee shall have the obligation to maintain the pledged property in good condition. The pledgee shall be civilly liable for the loss or destruction of or damage to the pledged property resulting from his negligence in storage. Where the pledgee is unable to maintain the pledged property in good condition and may thus cause loss or destruction of or damage to the pledged property, the pledgor may demand that the pledgee have the pledged property deposited, or demand that his obligation be discharged in advance and the pledged property returned.

Article 70. Where there is a possibility for the pledged property to perish or for its value to obviously decline to a point sufficient to impair the rights of the pledgee, the pledgee may demand that the pledgor provide additional security in like amount. If

the pledgor refuses to provide the additional security, the pledgee may auction or sell the pledged property, and conclude an agreement with the pledgor that the proceeds from the auction or sale shall be used to pay in advance the debt secured or be deposited with a third party as agreed upon with the pledgor.

Article 71. Where the debtor performs his obligation at its maturity, or where the pledgor pays, prior to maturity, the debt secured, the pledgee shall return the pledged property. If the pledgee is not paid at the maturity of the obligation, he may conclude an agreement with the pledgor that the pledged property be converted into money in order to pay the debt, or he may auction or sell the said property according to law. Where the money converted from the pledged property or the proceeds from auction or sale exceed the debt secured, the balance shall be paid to the pledgor. Where the money or the proceeds do not cover the whole debt secured, the difference shall be paid by the debtor.

Article 72. The third party who secures the obligation of the debtor shall have the right of recourse against the debtor after the pledgee's enforcement of the right of the pledge.

Article 73. The right of pledge shall lapse due to loss or destruction of the pledged property. The compensation obtained for the loss or destruction shall be used as the pledged property.

Article 74. The right of pledge shall co-exist with the creditor's right secured. When the creditor's right lapses, the right of pledge shall also lapse.

## Section 2 Pledge of Rights

Article 75. The following rights may be pledged: (1) bills of exchange, cheques,

promissory notes, bonds, certificates of deposit, warehouse receipts, bills of lading; (2) shares of stocks or certificates of stocks which are transferable according to law; (3) the rights to exclusive use of trademarks, the property right among patent rights and copyrights which are transferable according to law; and (4) other rights which may be pledged according to law.

Article 76. Where a bill of exchange, cheque, promissory note, bond, certificate of deposit, warehouse receipt or bill of lading is pledged, the document of title shall be delivered to the pledgee within the time limit specified in the pledge contract. The pledge contract shall become effective upon the delivery of the document of title.

Article 77. Where a bill of exchange, cheque, promissory note, bond, certificate of deposit warehouse receipt or bill of lading, which carries the date of payment or the date of delivery of goods, is pledged and if the date of its payment or delivery of goods is prior to the time limit for the performance of the obligation, the pledgee may be paid or accept the delivery of the goods before the expiration of the time limit for the performance of the obligation, and conclude an agreement with the pledgor that the payment or the goods accepted shall be used to pay in advance the debt secured or be deposited with a third party as agreed upon with the pledgor.

Article 78. Where certificates of stock transferable according to law are pledged, the pledgor and the pledgee shall conclude a contract in writing and register the pledge contract with the securities registration authorities. The pledge contract shall become effective on the date of the registration. The certificates of stocks pledged may not be transferred, unless agreed between the pledgor and the pledgee. The proceeds the pledgor obtained from the transfer of the certificates of stocks shall be used to pay in advance the pledgee's claims secured, or be deposited with a third party as agreed

upon with the pledgor. Where shares of stocks of a limited liability company are pledged, the relevant provisions of the Company Law governing the transfer of shares shall apply. The pledge contract shall become effective on the date on which the pledge of shares is written into the shareholders' name-list.

Article 79. Where the right to exclusive use of trademarks, the property rights among patent rights and copyrights transferable according to law are pledged, the pledgor and the pledgee shall conclude a contract in writing and register the pledge contract with the administrative department in charge. The pledge contract shall become effective upon registration.

Article 80. If a right mentioned in Article 79 of this Law is pledged, the pledgor may not transfer or permit the right to be used by another , unless agreed between the pledgee and the pledgor. The proceeds from the transfer or the use obtained by the pledgor shall be used to pay in advance the pledgee's claims secured or be deposited with a third party as agreed between the pledgor and the pledgee.

Article 81. The pledge of rights is governed not only by the provisions of this Section, but also by the provisions of Section 1 of this Chapter.